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HELIO Data Model

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1 HELIO Data Model

1.1 Rationale

HELIO provides a set of largely independent services which were developed by a number of institutions without reference to one another. Each service provides therefore its own data model, even though they are not formally defined. One of the declared aims of this project is to enable scientists to find their required data more easily which implies that they need to use HELIO services in connection with each other. That means using information gained from one service as a constraint or input parameter in another service. To enable this, a higher, overarching data model is required. On the other hand it is also desirable to keep the independence of each service which enables the service developers to maintain an agile development process. The HELIO system allows combining these two requirements.

All HELIO services produce their output in VOTable format [3] which is an XML format for the exchange of tabular data in Virtual Observatories. Part of the definition of this format is the inclusion of the semantic concepts of UCD [2] and UType [1]. UCD is a list of controlled vocabulary to semantically classify content and UType is a string which links content to a concept in a data model. With the help of UTypes we bind the data model which all services implicitly implement to a HELIO overarching data model with those help users can link data from delivered from one service to data from another service.

1.2 Data Model outlines

The HELIO data model ensures that the same concept is mapped to the same data type everywhere in the project. It is modular structured (see Figure 1), so that a data model is developed for every service but also uses the common concept in areas which are required in more than one service. The modularity helps with the maintainability of the data model. Within each of these separate models the classes are defined with the heliophysics domain in mind, so that for a scientist logical structures emerge.

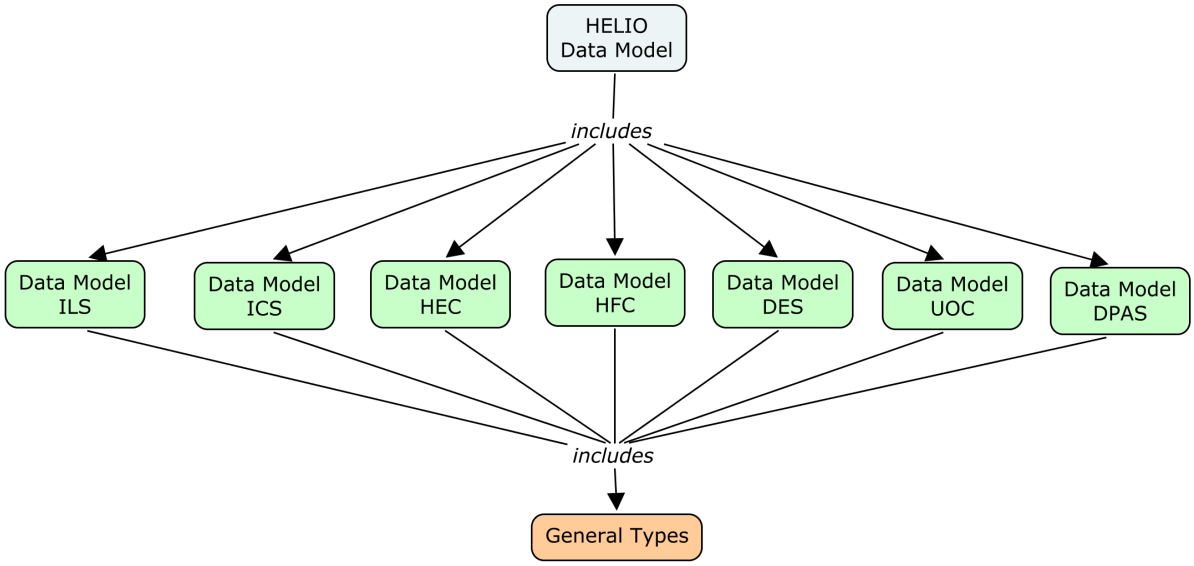

Figure 1: Overview of the Data Model

The content of any service does not overlap substantially with any other service. There are concepts which are inherently present in most services such as time. For most services time

is an important concept since events are defined using time periods, images and data are taken at a specific time or over a specific period, instruments operate over time periods. For a heliophysics data model it is not enough to define that something is a time stamp of a certain structure, but the exact meaning of that time needs to be known. When a scientists compares data from different catalogues it is important to know whether the time presented is an in-situ time of the instrument or a predicted time back at the sun. Only in that way they can know whether a propagation needs to be performed to arrive at meaningful conclusions. For this reason the data model establishes a higher granularity for this concept than the services themselves. Figure 2 shows an illustration of the concept of time period as modelled in the data model. Other classes which are used by more than one service include concepts for location and primitive types for bounding rectangles, URL, and specific heliophysics classification types.

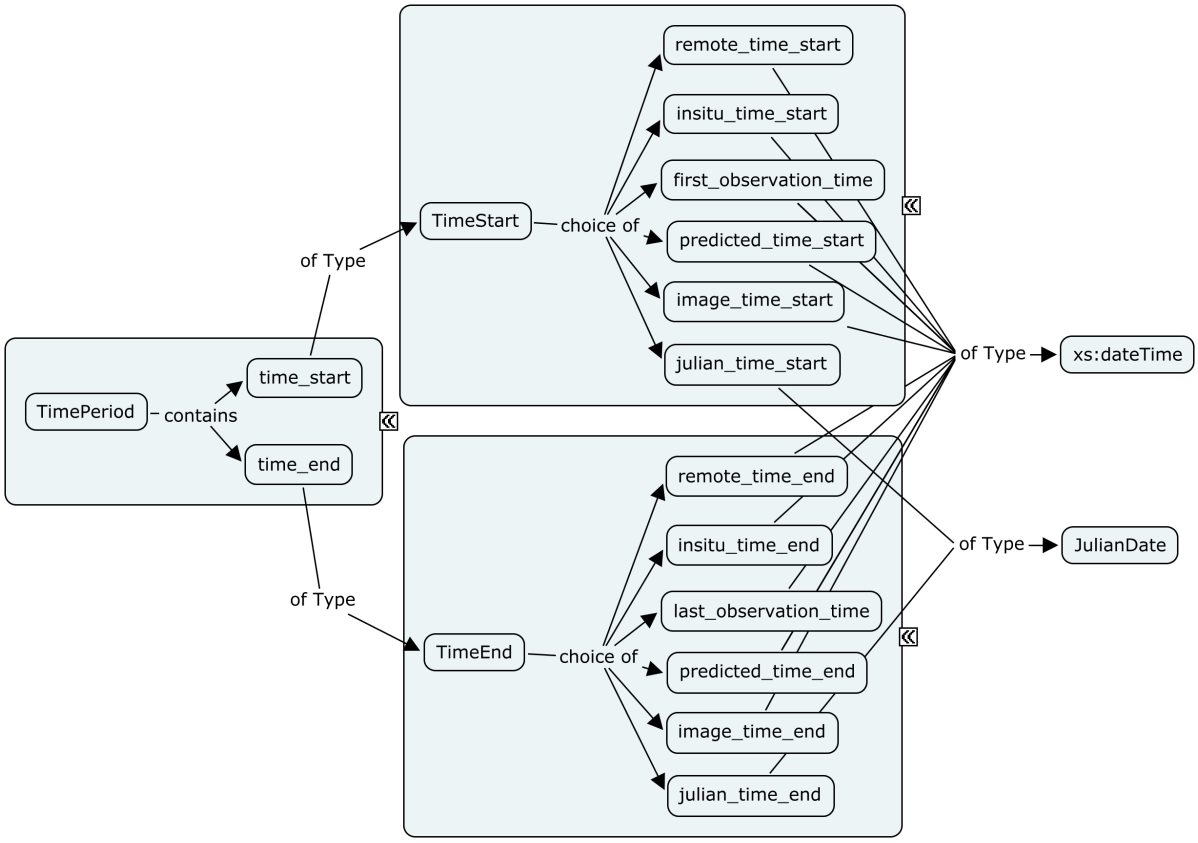

Figure 2: Example of cascading structure on class TimePeriod

2 HELIO Data Model Schema documentation

2.1 Table of Contents

- Schema Document Properties

2.2 Schema Document Properties

Target Namespace None

Element and • Global element and attribute declarations belong to this

Attribute Namespaces	schema's target namespace. • By default, local element declarations have no namespace. • By default, local attribute declarations have no namespace.
Schema Composition	• This schema includes components from the following schema document(s): o helio_data_model_ics.xsd o helio_data_model_ils.xsd o helio_data_model_hec.xsd o helio_data_model_hfc.xsd o helio_data_model_des.xsd o helio_data_model_uoc.xsd o helio_data_model_dpas.xsd

2.2.1 Declared Namespaces

Prefix	Namespace
xml	http://www.w3.org/XML/1998/namespace
xs	http://www.w3.org/2001/XMLSchema

Schema Component Representation

```
<xs:schema>
<xs:include schemaLocation="helio_data_model_ics.xsd"/>
<xs:include schemaLocation="helio_data_model_ils.xsd"/>
<xs:include schemaLocation="helio_data_model_hec.xsd"/>
<xs:include schemaLocation="helio_data_model_hfc.xsd"/>
<xs:include schemaLocation="helio_data_model_des.xsd"/>
<xs:include schemaLocation="helio_data_model_uoc.xsd"/>
<xs:include schemaLocation="helio_data_model_dpas.xsd"/>
...
</xs:schema>
```

---

3 General Types

3.1 Table of Contents

- Schema Document Properties
- Global Declarations
  - Attribute: **coordinate_system**
  - Element: **comment**
  - Element: **externale_reference_id**
  - Element: **instrument**
  - Element: **location**
  - Element: **observatory_name**
  - Element: **time**
  - Element: **time_period**
- Global Definitions
  - Complex Type: **BoundingRectangle**

- Complex Type: **FileSize**
- Complex Type: **JulianDate**
- Complex Type: **Location**
- Complex Type: **MagneticFieldType**
- Complex Type: **Time**
- Complex Type: **TimeEnd**
- Complex Type: **TimePeriod**
- Complex Type: **TimeSeriesCoordinate**
- Complex Type: **TimeStart**
- Simple Type: **CarringtonType**
- Simple Type: **Count**
- Simple Type: **DeltaTime**
- Simple Type: **Email**
- Simple Type: **ID**
- Simple Type: **NAR**
- Simple Type: **SatId**
- Simple Type: **URL**

3.2 Schema Document Properties

Target Namespace	None
Version	0.1
Element and Attribute Namespaces	• Global element and attribute declarations belong to this schema's target namespace. • By default, local element declarations have no namespace. • By default, local attribute declarations have no namespace.
Schema Composition	• This schema imports schema(s) from the following namespace(s): ○ *http://helio-vo.eu/xml/Instruments/v0.1* (at http://www.helio-vo.eu/services/xml/instruments.xsd)
Documentation	General Helio Types - used in other parts of the data model

3.2.1 Declared Namespaces

Prefix	Namespace
xml	http://www.w3.org/XML/1998/namespace
xs	http://www.w3.org/2001/XMLSchema
ns1	http://helio-vo.eu/xml/Instruments/v0.1

Schema Component Representation

```
<xs:schema version="0.1">
<xs:import namespace="http://helio-vo.eu/xml/Instruments/v0.1"
schemaLocation="http://www.helio-vo.eu/services/xml/instruments.xsd"/>
...
</xs:schema>
```

3.3 Global Declarations

3.3.1 Attribute: coordinate_system

Name coordinate_system
Type Locally-defined simple type
Default Value HCI
XML Instance Representation
coordinate_system="xs:string (*value* comes from list: {'HGI'|'HCI'|'Carrington'|'HEE'|'HG'})"
Schema Component Representation
<xs:attribute name="coordinate_system" default="HCI">
<xs:simpleType>
<xs:restriction base="xs:string">
<xs:enumeration value="HGI"/>
<xs:enumeration value="HCI"/>
<xs:enumeration value="Carrington"/>
<xs:enumeration value="HEE"/>
<xs:enumeration value="HG"/>
</xs:restriction>
</xs:simpleType>
</xs:attribute>

3.3.2 Element: comment

Name comment
Type xs:string
Nillable no
Abstract no
XML Instance Representation
<comment> xs:string </comment>
Schema Component Representation
<xs:element name="comment" type="xs:string"/>

3.3.3 Element: externale_reference_id

Name externale_reference_id
Type ID
Nillable no
Abstract no
XML Instance Representation
<externale_reference_id> ID </externale_reference_id>
Schema Component Representation
<xs:element name="externale_reference_id" type="ID"/>

3.3.4 Element: instrument

Name instrument
Type ns1:instrument
Nillable no
Abstract no
XML Instance Representation
<instrument> ns1:instrument </instrument>
Schema Component Representation
<xs:element name="instrument" type="ns1:instrument"/>

3.3.5 Element: location

Name location
Type Location
Nillable no
Abstract no
XML Instance Representation
<location
coordinate_system="[1]">
Start Choice [1]
Start Sequence [0..1]
<long_hg> ... </long_hg> [1]
<lat_hg> ... </lat_hg> [1]
<long_err> ... </long_err> [0..1]
End Sequence
Start Sequence [0..1]
<x_cart> ... </x_cart> [1]
<y_cart> ... </y_cart> [1]
<radial_arcsec> ... </radial_arcsec> [1]
End Sequence
Start Sequence [0..1]
<long_carr> ... </long_carr> [1]
<lat_carr> ... </lat_carr> [0..1]
End Sequence
Start Sequence [0..1]
<pa> ... </pa> [1]
<pa_measure> ... </pa_measure> [0..1]
<pa_width> ... </pa_width> [1]
<pa_width_lower_limit> xs:string (*value* comes from list: {'>'|''}) </pa_width_lower_limit>
[0..1]
End Sequence
Start Sequence [0..1]
<long_hee> ... </long_hee> [1]
<lat_hee> ... </lat_hee> [1]
End Sequence
Start Sequence [0..1]
<long_hci> ... </long_hci> [1]
<lat_hci> ... </lat_hci> [1]

<r_hci> xs:double </r_hci> [0..1]
End Sequence
Start Sequence [0..1]
<long_hgi> ... </long_hgi> [1]
<lat_hgi> ... </lat_hgi> [1]
<r_hgi> xs:double </r_hgi> [0..1]
End Sequence
Start Sequence [0..1]
<x_pix> ... </x_pix> [1]
<y_pix> ... </y_pix> [1]
End Sequence
<time_series> TimeSeriesCoordinate </time_series> [1]
End Choice
</location>
Schema Component Representation
<xs:element name="location" type="Location"/>

3.3.6 Element: observatory_name

Name observatory_name
Type xs:string
Nillable no
Abstract no
XML Instance Representation
<observatory_name> xs:string </observatory_name>
Schema Component Representation
<xs:element name="observatory_name" type="xs:string"/>

3.3.7 Element: time

Name time
Type Time
Nillable no
Abstract no
XML Instance Representation
<time>
Start Choice [1]
<time_start> TimeStart </time_start> [1]
<time_end> TimeEnd </time_end> [1]
<time_period> TimePeriod </time_period> [1]
<time_peak> xs:dateTime </time_peak> [1]
<time_1au> xs:dateTime </time_1au> [1]
<time_observation> xs:dateTime </time_observation> [1]
<time_creation> xs:dateTime </time_creation> [1]
<time> xs:dateTime </time> [1]
<julian_time> JulianDate </julian_time> [1]
End Choice
</time>

Schema Component Representation
<xs:element name="time" type="Time"/>

3.3.8 Element: time_period

Name time_period
Type TimePeriod
Nillable no
Abstract no
XML Instance Representation
<time_period>
<time_start> TimeStart </time_start> [1]
<time_end> TimeEnd </time_end> [1]
</time_period>
Schema Component Representation
<xs:element name="time_period" type="TimePeriod"/>

3.4 Global Definitions

3.4.1 Complex Type: BoundingRectangle

Super-types: None
Sub-types: None
Name BoundingRectangle
Abstract no
XML Instance Representation
<...>
Start Choice [1]
<coord_image> Location </coord_image> [2..4]
<coord_sphere> Location </coord_sphere> [4..4]
<coord_time_series> xs:float </coord_time_series> [2..4]
End Choice
</...>
Schema Component Representation
<xs:complexType name="BoundingRectangle">
<xs:choice>
<xs:element name="coord_image" type="Location" maxOccurs="4" minOccurs="2"/>
<xs:element name="coord_sphere" type="Location" maxOccurs="4" minOccurs="4"/>
<xs:element name="coord_time_series" type="xs:float" maxOccurs="4" minOccurs="2"/>
</xs:choice>
</xs:complexType>

3.4.2 Complex Type: FileSize

Super-types: None
Sub-types: None
Name FileSize

Abstract no
XML Instance Representation
<...>
Start Choice [1]
<file_size_byte> xs:integer </file_size_byte> [1]
<file_size_kbyte> xs:integer </file_size_kbyte> [1]
<file_size_Mbyte> xs:integer </file_size_Mbyte> [1]
<file_size_Gbyte> xs:integer </file_size_Gbyte> [1]
End Choice
</...>
Schema Component Representation
<xs:complexType name="FileSize">
<xs:choice>
<xs:element name="file_size_byte" type="xs:integer"/>
<xs:element name="file_size_kbyte" type="xs:integer"/>
<xs:element name="file_size_Mbyte" type="xs:integer"/>
<xs:element name="file_size_Gbyte" type="xs:integer"/>
</xs:choice>
</xs:complexType>

3.4.3 Complex Type: JulianDate

Super-types: None
Sub-types: None
Name JulianDate
Abstract no
XML Instance Representation
<...>
Start Choice [1]
<julian_date_int> xs:integer </julian_date_int> [1]
<julian_date_double> xs:double </julian_date_double> [1]
<julian_date_whole> xs:integer </julian_date_whole> [1]
<julian_date_fraction> xs:double </julian_date_fraction> [1]
End Choice
</...>
Schema Component Representation
<xs:complexType name="JulianDate">
<xs:choice>
<xs:element name="julian_date_int" type="xs:integer"/>
<xs:element name="julian_date_double" type="xs:double"/>
<xs:sequence>
<xs:element name="julian_date_whole" type="xs:integer"/>
<xs:element name="julian_date_fraction" type="xs:double"/>
</xs:sequence>
</xs:choice>
</xs:complexType>

3.4.4 Complex Type: Location

Super-types: None

Sub-types: None

Name Location

Abstract no

XML Instance Representation

<...
coordinate_system="[1]">
Start Choice [1]
Start Sequence [0..1]
<long_hg> ... </long_hg> [1]
<lat_hg> ... </lat_hg> [1]
<long_err> ... </long_err> [0..1]
End Sequence
Start Sequence [0..1]
<x_cart> ... </x_cart> [1]
<y_cart> ... </y_cart> [1]
<radial_arcsec> ... </radial_arcsec> [1]
End Sequence
Start Sequence [0..1]
<long_carr> ... </long_carr> [1]
<lat_carr> ... </lat_carr> [0..1]
End Sequence
Start Sequence [0..1]
<pa> ... </pa> [1]
<pa_measure> ... </pa_measure> [0..1]
<pa_width> ... </pa_width> [1]
<pa_width_lower_limit> xs:string (*value* comes from list: {'>'|''}) </pa_width_lower_limit>
[0..1]
End Sequence
Start Sequence [0..1]
<long_hee> ... </long_hee> [1]
<lat_hee> ... </lat_hee> [1]
End Sequence
Start Sequence [0..1]
<long_hci> ... </long_hci> [1]
<lat_hci> ... </lat_hci> [1]
<r_hci> xs:double </r_hci> [0..1]
End Sequence
Start Sequence [0..1]
<long_hgi> ... </long_hgi> [1]
<lat_hgi> ... </lat_hgi> [1]
<r_hgi> xs:double </r_hgi> [0..1]
End Sequence
Start Sequence [0..1]
<x_pix> ... </x_pix> [1]
<y_pix> ... </y_pix> [1]
End Sequence
<time_series> TimeSeriesCoordinate </time_series> [1]

End Choice
</...>
Schema Component Representation
<xs:complexType name="Location">
<xs:sequence>
<xs:choice>
<xs:sequence maxOccurs="1" minOccurs="0">
<xs:element name="long_hg" maxOccurs="1" minOccurs="1"/>
<xs:element name="lat_hg" maxOccurs="1" minOccurs="1"/>
<xs:element name="long_err" maxOccurs="1" minOccurs="0"/>
</xs:sequence>
<xs:sequence maxOccurs="1" minOccurs="0">
<xs:element name="x_cart" maxOccurs="1" minOccurs="1"/>
<xs:element name="y_cart" maxOccurs="1" minOccurs="1"/>
<xs:element name="radial_arcsec" maxOccurs="1" minOccurs="1"/>
</xs:sequence>
<xs:sequence maxOccurs="1" minOccurs="0">
<xs:element name="long_carr" maxOccurs="1" minOccurs="1"/>
<xs:element name="lat_carr" maxOccurs="1" minOccurs="0"/>
</xs:sequence>
<xs:sequence maxOccurs="1" minOccurs="0">
<xs:element name="pa" maxOccurs="1" minOccurs="1"/>
<xs:element name="pa_measure" maxOccurs="1" minOccurs="0"/>
<xs:element name="pa_width" maxOccurs="1" minOccurs="1"/>
<xs:element name="pa_width_lower_limit" maxOccurs="1" minOccurs="0">
<xs:simpleType>
<xs:restriction base="xs:string">
<xs:enumeration value=">"/>
<xs:enumeration value=""/>
</xs:restriction>
</xs:simpleType>
</xs:element>
</xs:sequence>
<xs:sequence maxOccurs="1" minOccurs="0">
<xs:element name="long_hee" maxOccurs="1" minOccurs="1"/>
<xs:element name="lat_hee" maxOccurs="1" minOccurs="1"/>
</xs:sequence>
<xs:sequence maxOccurs="1" minOccurs="0">
<xs:element name="long_hci" maxOccurs="1" minOccurs="1"/>
<xs:element name="lat_hci" maxOccurs="1" minOccurs="1"/>
<xs:element name="r_hci" type="xs:double" maxOccurs="1" minOccurs="0"/>
</xs:sequence>
<xs:sequence maxOccurs="1" minOccurs="0">
<xs:element name="long_hgi" maxOccurs="1" minOccurs="1"/>
<xs:element name="lat_hgi" maxOccurs="1" minOccurs="1"/>
<xs:element name="r_hgi" type="xs:double" maxOccurs="1" minOccurs="0"/>
</xs:sequence>
<xs:sequence maxOccurs="1" minOccurs="0">
<xs:element name="x_pix" maxOccurs="1" minOccurs="1"/>
<xs:element name="y_pix" maxOccurs="1" minOccurs="1"/>

</xs:sequence>
<xs:element name="time_series" type="TimeSeriesCoordinate"/>
</xs:choice>
</xs:sequence>
<xs:attribute ref="coordinate_system" use="required"/>
</xs:complexType>

3.4.5 Complex Type: MagneticFieldType

Super-types: None

Sub-types: None

Name MagneticFieldType

Abstract no

XML Instance Representation
<...>
Start Choice [1]
<magnetic_field_nT> xs:float </magnetic_field_nT> [1]
End Choice
</...>
Schema Component Representation
<xs:complexType name="MagneticFieldType">
<xs:choice>
<xs:element name="magnetic_field_nT" type="xs:float"/>
</xs:choice>
</xs:complexType>

3.4.6 Complex Type: Time

Super-types: None

Sub-types: None

Name Time

Abstract no

XML Instance Representation
<...>
Start Choice [1]
<time_start> TimeStart </time_start> [1]
<time_end> TimeEnd </time_end> [1]
<time_period> TimePeriod </time_period> [1]
<time_peak> xs:dateTime </time_peak> [1]
<time_1au> xs:dateTime </time_1au> [1]
<time_observation> xs:dateTime </time_observation> [1]
<time_creation> xs:dateTime </time_creation> [1]
<time> xs:dateTime </time> [1]
<julian_time> JulianDate </julian_time> [1]
End Choice
</...>
Schema Component Representation
<xs:complexType name="Time">

<xs:choice>
<xs:element name="time_start" type="TimeStart"/>
<xs:element name="time_end" type="TimeEnd"/>
<xs:element name="time_period" type="TimePeriod"/>
<xs:element name="time_peak" type="xs:dateTime"/>
<xs:element name="time_1au" type="xs:dateTime"/>
<xs:element name="time_observation" type="xs:dateTime"/>
<xs:element name="time_creation" type="xs:dateTime"/>
<xs:element name="time" type="xs:dateTime"/>
<xs:element name="julian_time" type="JulianDate"/>
</xs:choice>
</xs:complexType>

3.4.7 Complex Type: TimeEnd

Super-types: None

Sub-types: None

Name TimeEnd

Abstract no

XML Instance Representation
<...>
Start Choice [1]
<remote_time_end> xs:dateTime </remote_time_end> [1]
<insitu_time_end> xs:dateTime </insitu_time_end> [1]
<last_observation_time> xs:dateTime </last_observation_time> [1]
<predicted_time_end> xs:dateTime </predicted_time_end> [1]
<image_time_end> xs:dateTime </image_time_end> [1]
<julian_time_end> JulianDate </julian_time_end> [1]
End Choice
</...>
Schema Component Representation
<xs:complexType name="TimeEnd">
<xs:choice>
<xs:element name="remote_time_end" type="xs:dateTime"/>
<xs:element name="insitu_time_end" type="xs:dateTime"/>
<xs:element name="last_observation_time" type="xs:dateTime"/>
<xs:element name="predicted_time_end" type="xs:dateTime"/>
<xs:element name="image_time_end" type="xs:dateTime"/>
<xs:element name="julian_time_end" type="JulianDate"/>
</xs:choice>
</xs:complexType>

3.4.8 Complex Type: TimePeriod

Super-types: None

Sub-types: None

Name TimePeriod

Abstract no

XML Instance Representation
<...>
<time_start> TimeStart </time_start> [1]
<time_end> TimeEnd </time_end> [1]
</...>
Schema Component Representation
<xs:complexType name="TimePeriod">
<xs:sequence>
<xs:element name="time_start" type="TimeStart"/>
<xs:element name="time_end" type="TimeEnd"/>
</xs:sequence>
</xs:complexType>

3.4.9 Complex Type: TimeSeriesCoordinate

Super-types: None
Sub-types: None
Name TimeSeriesCoordinate
Abstract no
XML Instance Representation
<...>
<x_time> Time </x_time> [1]
<y_measurement> xs:float </y_measurement> [1]
</...>
Schema Component Representation
<xs:complexType name="TimeSeriesCoordinate">
<xs:sequence>
<xs:element name="x_time" type="Time" maxOccurs="1" minOccurs="1"/>
<xs:element name="y_measurement" type="xs:float" maxOccurs="1" minOccurs="1"/>
</xs:sequence>
</xs:complexType>

3.4.10 Complex Type: TimeStart

Super-types: None
Sub-types: None
Name TimeStart
Abstract no
XML Instance Representation
<...>
Start Choice [1]
<remote_time_start> xs:dateTime </remote_time_start> [1]
<insitu_time_start> xs:dateTime </insitu_time_start> [1]
<first_observation_time> xs:dateTime </first_observation_time> [1]
<predicted_time_start> xs:dateTime </predicted_time_start> [1]
<image_time_start> xs:dateTime </image_time_start> [1]
<julian_time_start> JulianDate </julian_time_start> [1]

End Choice
</...>
Schema Component Representation
<xs:complexType name="TimeStart">
<xs:choice>
<xs:element name="remote_time_start" type="xs:dateTime"/>
<xs:element name="insitu_time_start" type="xs:dateTime"/>
<xs:element name="first_observation_time" type="xs:dateTime"/>
<xs:element name="predicted_time_start" type="xs:dateTime"/>
<xs:element name="image_time_start" type="xs:dateTime"/>
<xs:element name="julian_time_start" type="JulianDate"/>
</xs:choice>
</xs:complexType>

3.4.11 Simple Type: CarringtonType

Super-types: xs:integer < **CarringtonType** (by restriction)

Sub-types: None

Name CarringtonType

Content

- Base XSD Type: integer

Schema Component Representation
<xs:simpleType name="CarringtonType">
<xs:restriction base="xs:integer"/>
</xs:simpleType>

3.4.12 Simple Type: Count

Super-types: xs:double < **Count** (by restriction)

Sub-types: None

Name Count

Content

- Base XSD Type: double
- *value* >= 0

Schema Component Representation
<xs:simpleType name="Count">
<xs:restriction base="xs:double">
<xs:minInclusive value="0"/>
</xs:restriction>
</xs:simpleType>

3.4.13 Simple Type: DeltaTime

Super-types: xs:double < **DeltaTime** (by restriction)

Sub-types: None

Name DeltaTime

Content
- Base XSD Type: double

Schema Component Representation
<xs:simpleType name="DeltaTime">
<xs:restriction base="xs:double"/>
</xs:simpleType>

3.4.14 Simple Type: Email

Super-types: xs:string < **Email** (by restriction)

Sub-types: None

Name Email

Content
- Base XSD Type: string
- *pattern* = \w+([-+.']\w+)*@\w+([-.]\w+)*\.\w+([-.]\w+)*

Documentation any valid email address

Schema Component Representation
<xs:simpleType name="Email">
<xs:restriction base="xs:string">
<xs:pattern value="\w+([-+.']\w+)*@\w+([-.]\w+)*\.\w+([-.]\w+)*"/>
</xs:restriction>
</xs:simpleType>

3.4.15 Simple Type: ID

Super-types: ID < **ID** (by restriction)

Sub-types:
- ID (by restriction)
- SatId (by restriction)

Name ID

Content
- Base XSD Type: ID

Schema Component Representation
<xs:simpleType name="ID">
<xs:restriction base="xs:ID"/>
</xs:simpleType>

3.4.16 Simple Type: NAR

Super-types: xs:integer < **NAR** (by restriction)

Sub-types: None

Name NAR

Content

- Base XSD Type: integer

Schema Component Representation
<xs:simpleType name="NAR">
<xs:restriction base="xs:integer"/>
</xs:simpleType>

3.4.17 Simple Type: SatId

Super-types: ID < ID (by restriction) < **SatId** (by restriction)

Sub-types: None

Name SatId

Content

- Base XSD Type: ID
- *pattern* = [1-2][0-9][0-9][0-9]-[0-9][0-9][0-9][A-Z]

Schema Component Representation
<xs:simpleType name="SatId">
<xs:restriction base="xs:ID">
<xs:pattern value="[1-2][0-9][0-9][0-9]-[0-9][0-9][0-9][A-Z]"/>
</xs:restriction>
</xs:simpleType>

3.4.18 Simple Type: URL

Super-types: xs:anyURI < **URL** (by restriction)

Sub-types: None

Name URL

Content

- Base XSD Type: anyURI

Schema Component Representation
<xs:simpleType name="URL">
<xs:restriction base="xs:anyURI"/>
</xs:simpleType>

---

4 HEC

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- Simple Type: **OpticalType**
- Simple Type: **SolarWindCategory**
- Simple Type: **TimeModifier**
- Simple Type: **XrayType**
- Simple Type: **ZurichClass**

4.2 Schema Document Properties

Target Namespace None

Element and Attribute Namespaces

- Global element and attribute declarations belong to this schema's target namespace.
- By default, local element declarations have no namespace.
- By default, local attribute declarations have no namespace.

Schema Composition

- This schema imports schema(s) from the following namespace(s):
  - *http://helio-vo.eu/xml/Instruments/v0.1* (at http://www.helio-vo.eu/services/xml/instruments.xsd)
- This schema includes components from the following schema document(s):
  - helio_data_model-generalTypes.xsd

4.2.1 Declared Namespaces

Prefix	Namespace
xml	http://www.w3.org/XML/1998/namespace
xs	http://www.w3.org/2001/XMLSchema
ns1	http://helio-vo.eu/xml/Instruments/v0.1

Schema Component Representation

```
<xs:schema>
<xs:import namespace="http://helio-vo.eu/xml/Instruments/v0.1"
schemaLocation="http://www.helio-vo.eu/services/xml/instruments.xsd"/>
<xs:include schemaLocation="helio_data_model-generalTypes.xsd"/>
...
</xs:schema>
```

4.3 Global Declarations

4.3.1 Element: active_region

Name active_region
Type ActiveRegion
Nillable no
Abstract no
XML Instance Representation
<active_region>
<nar> NAR </nar> [1]
<area> xs:integer </area> [0..1]
<zurich_class> ZurichClass </zurich_class> [0..1]
<p_value> xs:string (*pattern* = [AHKRSXahkrsx]) </p_value> [0..1]
<c_value> xs:string (*pattern* = [CIOXciox]) </c_value> [0..1]
<dlong_hg> xs:integer </dlong_hg> [0..1]
<number_sunspots> Count </number_sunspots> [0..1]
<magnetic_class> MagneticClass </magnetic_class> [0..1]
<region_type> xs:string (*value* comes from list: {'H-ALPHA PLAGES WITHOUT SPOTS'|'REGIONS DUE TO RETURN'|'REGIONS WITH SUNSPOTS'}) </region_type> [1]
</active_region>
Schema Component Representation
<xs:element name="active_region" type="ActiveRegion"/>

4.3.2 Element: cme

Name cme
Type CMEType
Nillable no
Abstract no
XML Instance Representation
<cme>
<location> ... </location> [1]
<time_start> Time </time_start> [1]
<time_end> Time </time_end> [0..1]
<time_onset> Time </time_onset> [0..1]
<time_onset_not_valid> xs:boolean </time_onset_not_valid> [0..1]
<time_1au> Time </time_1au> [0..1]
<duration_lift_off_h> DeltaTime </duration_lift_off_h> [0..1]
<velocity> Velocity </velocity> [1..*]
<acceleration> AccelerationType </acceleration> [0..1]
<data_gap> xs:boolean </data_gap> [0..1]
<cme_type> xs:string (*pattern* = [0ABCDEF]) </cme_type> [0..1]
<brightness> xs:string (*pattern* = B[123]) </brightness> [0..1]
<description> xs:string </description> [0..1]
<halo> xs:string (*value* comes from list: {'H2'|'H3'|'H4'|''}) </halo> [0..1]
<cme_number> [0..1]

Start Choice [1]
<soho_cme_number> xs:string </soho_cme_number> [1]
<stereoa_cme_number> xs:string </stereoa_cme_number> [1]
<stereob_cme_number> xs:string </stereob_cme_number> [1]
<seeds_cme_number> ... </seeds_cme_number> [1]
End Choice
</cme_number>
<event_detail_url> URL </event_detail_url> [0..1]
<position_description> xs:string (*value* comes from list: {'B?'|'BLimb-E'|'BLimb-N'|'BLimb-NE'|'BLimb-NW'|'BLimb-S'|'BLimb-SE'|'BLimb-SW'|'BLimb-W'|'Backside'|''})
</position_description> [0..1]
<filar> xs:string (*value* comes from list: {'DSF'|'FILA'}) </filar> [0..1]
</cme>
Schema Component Representation
<xs:element name="cme" type="CMEType"/>

4.3.3 Element: distance

Name distance
Type Distance
Nillable no
Abstract no
XML Instance Representation
<distance>
Start Choice [1]
<distance_earth_mars_long> xs:float </distance_earth_mars_long> [1]
End Choice
</distance>
Schema Component Representation
<xs:element name="distance" type="Distance"/>

4.3.4 Element: eit

Name eit
Type EITWaveType
Nillable no
Abstract no
XML Instance Representation
<eit>
<time_start> Time </time_start> [1]
<img_time> Time </img_time> [0..1]
<previmg_time> Time </previmg_time> [0..1]
<quality> EITQuality </quality> [0..1]
<location> ... </location> [1..*]
<velocity> Velocity </velocity> [1..*]
</eit>

Schema Component Representation
<xs:element name="eit" type="EITWaveType"/>

4.3.5 Element: event_list

Name event_list
Type EventList
Nillable no
Abstract no
XML Instance Representation
<event_list>
<time_period> ... </time_period> [1]
<list_id> ID </list_id> [1]
<list_name> xs:string </list_name> [1]
<list_description> xs:string </list_description> [1]
<caviats> xs:string </caviats> [0..*]
<observatory_instrument_id> ns1:instrument </observatory_instrument_id> [1..*]
<list_type> HECListType </list_type> [1]
</event_list>
Schema Component Representation
<xs:element name="event_list" type="EventList"/>

4.3.6 Element: flare

Name flare
Type FlareType
Nillable no
Abstract no
XML Instance Representation
<flare>
<time_period> ... </time_period> [1]
<time_peak> Time </time_peak> [1]
<location> ... </location> [1]
<nar> NAR </nar> [0..1]
<magnitude> Magnitude </magnitude> [1..*]
<duration> DeltaTime </duration> [0..1]
<time_start_modifier> TimeModifier </time_start_modifier> [0..1]
<time_end_modifier> TimeModifier </time_end_modifier> [0..1]
<time_peak_modifier> TimeModifier </time_peak_modifier> [0..1]
<rhessi_flare_number> ID </rhessi_flare_number> [0..1]
<noaa_flare_number> ID </noaa_flare_number> [0..1]
<phase_angle> xs:float </phase_angle> [0..1]
<flag> FlareFlagType </flag> [0..*]
<event_detail_url> URL </event_detail_url> [0..1]
<observation_time_offset_s> xs:long </observation_time_offset_s> [0..1]
</flare>

Schema Component Representation
<xs:element name="flare" type="FlareType"/>

4.3.7 Element: fobush_decrease

Name fobush_decrease
Type ForbushDecrease
Nillable no
Abstract no
XML Instance Representation
<fobush_decrease>
<time_start> Time </time_start> [1]
<flag_ssc> xs:string (*value* comes from list: {'sc'|''}) </flag_ssc> [1]
<fe_magnitude> xs:float </fe_magnitude> [1]
<kp_max> xs:float </kp_max> [1]
<b_max> xs:float </b_max> [1]
<v_solar_wind> Velocity </v_solar_wind> [1]
<axy_min> xs:float </axy_min> [1]
<az_r> xs:float </az_r> [1]
<duration_to_min> DeltaTime </duration_to_min> [1]
<duration_to_max_decrement> DeltaTime </duration_to_max_decrement> [1]
<dc_min> xs:float </dc_min> [1]
<fe_to_b> xs:float </fe_to_b> [1]
<tilt> xs:float </tilt> [1]
</fobush_decrease>
Schema Component Representation
<xs:element name="fobush_decrease" type="ForbushDecrease"/>

4.3.8 Element: icme

Name icme
Type InsituCMEType
Nillable no
Abstract no
XML Instance Representation
<icme>
<plasma_magnetic_field_strength> MagneticFieldType </plasma_magnetic_field_strength> [1]
<plasma_magnetic_field_strength_error> MagneticFieldType </plasma_magnetic_field_strength_error> [0..1]
<description> xs:string </description> [0..1]
<time_start> Time </time_start> [1]
<time_end> Time </time_end> [0..1]
<velocity> Velocity </velocity> [1..*]
<magnetic_field> MagneticField </magnetic_field> [0..*]
<flag> IcmeFlagType </flag> [0..*]

<pressure> [0..*]
Start Choice [1]
<total_pressure> TotalPressure </total_pressure> [0..*]
<p_dyn_mars> xs:float </p_dyn_mars> [0..1]
<p_dyn_earth> xs:float </p_dyn_earth> [0..1]
End Choice
</pressure>
<denisty> [0..1]
Start Choice [1]
<density_max_earth> xs:float </density_max_earth> [1]
End Choice
</denisty>
<background_count_rate> [0..*]
Start Choice [1]
<counts_max_goes> ... </counts_max_goes> [1]
<counts_max_mars> ... </counts_max_mars> [1]
End Choice
</background_count_rate>
</icme>
Schema Component Representation
<xs:element name="icme" type="InsituCMEType"/>

4.3.9 Element: interplanetary_shock

Name interplanetary_shock
Type InterplanetaryShockType
Nillable no
Abstract no
XML Instance Representation
<interplanetary_shock>
<time_start> Time </time_start> [1]
<zone> xs:integer (*value* comes from list: {'0'|'1'|'2'|'4'|'10'|'20'|'30'}) </zone> [0..1]
<description> xs:string </description> [0..1]
<flag> InterplanetaryShockFlag </flag> [0..*]
<magnetic_ratio> xs:float </magnetic_ratio> [0..1]
<normal_angle> xs:float </normal_angle> [0..1]
<pressure_ratio> pressure_ratio_type </pressure_ratio> [0..1]
<velocity> Velocity </velocity> [0..*]
</interplanetary_shock>
Schema Component Representation
<xs:element name="interplanetary_shock" type="InterplanetaryShockType"/>

4.3.10 Element: magnetic_storm

Name magnetic_storm
Type MagneticStormType

Nillable no

Abstract no

XML Instance Representation
<magnetic_storm>
<location> ... </location> [1..*]
<time_period> ... </time_period> [1]
<time_peak> Time </time_peak> [1]
<duration> DeltaTime </duration> [0..1]
<disturbance_storm_time> xs:integer </disturbance_storm_time> [0..1]
<aastar_max> xs:integer </aastar_max> [0..1]
<aastar_average> xs:integer </aastar_average> [0..1]
<aastar_sum> xs:integer </aastar_sum> [0..1]
<apstar_max> xs:integer </apstar_max> [0..1]
<apstar_average> xs:integer </apstar_average> [0..1]
<apstar_sum> xs:integer </apstar_sum> [0..1]
<number_stations_a> Count </number_stations_a> [0..1]
<number_stations_b> Count </number_stations_b> [0..1]
<number_stations_c> Count </number_stations_c> [0..1]
<number_stations_si> Count </number_stations_si> [0..1]
</magnetic_storm>
Schema Component Representation
<xs:element name="magnetic_storm" type="MagneticStormType"/>

4.3.11 Element: proton_event

Name proton_event

Type SolarEnergeticProtonType

Nillable no

Abstract no

XML Instance Representation
<proton_event>
<start_time> Time </start_time> [1]
<time_peak> Time </time_peak> [1]
<nar> NAR </nar> [1]
<location> ... </location> [1..*]
<proton_flux> Count </proton_flux> [1]
<associated_cme> ... </associated_cme> [1]
<associated_flare_peak> Time </associated_flare_peak> [1]
<magnitude> Magnitude </magnitude> [1..*]
</proton_event>
Schema Component Representation
<xs:element name="proton_event" type="SolarEnergeticProtonType"/>

4.3.12 Element: radio

Name radio

Type RadioType
Nillable no
Abstract no
XML Instance Representation
<radio>
<radio_245mhz> xs:integer </radio_245mhz> [0..1]
<radio_10cm> xs:integer </radio_10cm> [0..1]
<radio_seep_ii> xs:boolean </radio_seep_ii> [0..1]
<radio_seep_iv> xs:boolean </radio_seep_iv> [0..1]
<shortwave_fade> ... </shortwave_fade> [0..1]
<frequency> xs:integer </frequency> [0..1]
<frequency_start> xs:integer </frequency_start> [0..1]
<frequency_end> xs:integer </frequency_end> [0..1]
<circular_polarization_percent> xs:integer </circular_polarization_percent> [0..1]
<polarization_direction> xs:string (*pattern* = [LR]) </polarization_direction> [0..1]
<sfu_max> xs:float </sfu_max> [0..1]
<radio_class> xs:string </radio_class> [0..1]
<data_url> URL </data_url> [0..1]
<dyn_spectra> URL </dyn_spectra> [0..1]
</radio>
Schema Component Representation
<xs:element name="radio" type="RadioType"/>

4.3.13 Element: sir

Name sir
Type StreamInteractionRegion
Nillable no
Abstract no
XML Instance Representation
<sir>
<time_period> ... </time_period> [1]
<velocity> Velocity </velocity> [1..*]
<total_pressure> TotalPressure </total_pressure> [1..*]
<magnetic_field> MagneticField </magnetic_field> [1..*]
<flag> SirFlagType </flag> [0..*]
<np_max> xs:float </np_max> [0..1]
</sir>
Schema Component Representation
<xs:element name="sir" type="StreamInteractionRegion"/>

4.3.14 Element: solar_statistics

Name solar_statistics
Type SolarStatistics

Nillable no

Abstract no

XML Instance Representation
<solar_statistics>
<time_start> Time </time_start> [1]
<radio_flux_10cm> Count </radio_flux_10cm> [1]
<number_sunspots> Count </number_sunspots> [1]
<sunspot_area> xs:integer </sunspot_area> [1]
<number_new_regions> Count </number_new_regions> [1]
<stanford_solar_mean_field> xs:integer </stanford_solar_mean_field> [0..1]
<xray_bkg_flux> Magnitude </xray_bkg_flux> [1]
<number_c_flares> Count </number_c_flares> [1]
<number_m_flares> Count </number_m_flares> [1]
<number_x_flares> Count </number_x_flares> [1]
<number_opts_flares> Count </number_opts_flares> [1]
<number_opt1_flares> Count </number_opt1_flares> [1]
<number_opt2_flares> Count </number_opt2_flares> [1]
<number_opt3_flares> Count </number_opt3_flares> [1]
</solar_statistics>
Schema Component Representation
<xs:element name="solar_statistics" type="SolarStatistics"/>

4.3.15 Element: solar_wind

Name solar_wind

Type SolarWindTransientEvent

Nillable no

Abstract no

XML Instance Representation
<solar_wind>
<time_period> ... </time_period> [1]
<time_1au> Time </time_1au> [0..1]
<location> ... </location> [0..*]
<velocity_proton> Velocity </velocity_proton> [0..1]
<velocity_proton_error> Velocity </velocity_proton_error> [0..1]
<description> xs:string </description> [1]
<instsrument> ns1:instrument </instsrument> [0..*]
<data_h12> Time </data_h12> [0..1]
<category> SolarWindCategory </category> [0..*]
<magnetic_cloud_id> xs:float </magnetic_cloud_id> [0..1]
<magnetic_cloud_quality> xs:integer (1 < *value* <= 3) </magnetic_cloud_quality> [1]
<ip_shock_zone> xs:integer (0 < *value* <= 4) </ip_shock_zone> [0..1]
</solar_wind>
Schema Component Representation
<xs:element name="solar_wind" type="SolarWindTransientEvent"/>

4.3.16 Element: velocity

Name velocity
Type Velocity
Nillable no
Abstract no
XML Instance Representation
<velocity>
Start Choice [1]
<v> VelocityType </v> [1]
<v_min> VelocityType </v_min> [1]
<v_max> VelocityType </v_max> [1]
<v_max_sheath> VelocityType </v_max_sheath> [1]
<v_max_earth> VelocityType </v_max_earth> [1]
<v_init> VelocityType </v_init> [1]
<v_20r> VelocityType </v_20r> [1]
<v_final> VelocityType </v_final> [1]
<v_proton> VelocityType </v_proton> [1]
<v_projected> VelocityType </v_projected> [1]
<v_uncertainty_factor> xs:float </v_uncertainty_factor> [1]
<v_plane_of_sky> VelocityType </v_plane_of_sky> [1]
<dv> VelocityType </dv> [1]
<dv_time> VelocityType </dv_time> [1]
<magnetosonic_mach_number> ... </magnetosonic_mach_number> [1]
End Choice
</velocity>
Schema Component Representation
<xs:element name="velocity" type="Velocity"/>

4.4 Global Definitions

4.4.1 Complex Type: AccelerationType

Super-types: None
Sub-types: None
Name AccelerationType
Abstract no
XML Instance Representation
<...>
Start Choice [1]
<acceleration_ms-2> ... </acceleration_ms-2> [1]
End Choice
</...>
Schema Component Representation
<xs:complexType name="AccelerationType">
<xs:choice maxOccurs="1">
<xs:element name="acceleration_ms-2"/>
</xs:choice>

</xs:complexType>

4.4.2 Complex Type: ActiveRegion

Super-types: None

Sub-types: None

Name ActiveRegion

Abstract no

XML Instance Representation

<...>
<nar> NAR </nar> [1]
<area> xs:integer </area> [0..1]
<zurich_class> ZurichClass </zurich_class> [0..1]
<p_value> xs:string (*pattern* = [AHKRSXahkrsx]) </p_value> [0..1]
<c_value> xs:string (*pattern* = [CIOXciox]) </c_value> [0..1]
<dlong_hg> xs:integer </dlong_hg> [0..1]
<number_sunspots> Count </number_sunspots> [0..1]
<magnetic_class> MagneticClass </magnetic_class> [0..1]
<region_type> xs:string (*value* comes from list: {'H-ALPHA PLAGES WITHOUT SPOTS'|'REGIONS DUE TO RETURN'|'REGIONS WITH SUNSPOTS'}) </region_type> [1]
</...>

Schema Component Representation

```
<xs:complexType name="ActiveRegion">
<xs:sequence>
<xs:element name="nar" type="NAR" maxOccurs="1" minOccurs="1"/>
<xs:element name="area" type="xs:integer" maxOccurs="1" minOccurs="0"/>
<xs:element name="zurich_class" type="ZurichClass" maxOccurs="1" minOccurs="0"/>
<xs:element name="p_value" maxOccurs="1" minOccurs="0">
<xs:simpleType>
<xs:restriction base="xs:string">
<xs:pattern value="[AHKRSXahkrsx]"/>
</xs:restriction>
</xs:simpleType>
</xs:element>
<xs:element name="c_value" maxOccurs="1" minOccurs="0">
<xs:simpleType>
<xs:restriction base="xs:string">
<xs:pattern value="[CIOXciox]"/>
</xs:restriction>
</xs:simpleType>
</xs:element>
<xs:element name="dlong_hg" type="xs:integer" maxOccurs="1" minOccurs="0"/>
<xs:element name="number_sunspots" type="Count" maxOccurs="1" minOccurs="0"/>
<xs:element name="magnetic_class" type="MagneticClass" maxOccurs="1"
minOccurs="0"/>
<xs:element name="region_type" maxOccurs="1" minOccurs="1">
<xs:simpleType>
```

<xs:restriction base="xs:string">
<xs:enumeration value="H-ALPHA PLAGES WITHOUT SPOTS"/>
<xs:enumeration value="REGIONS DUE TO RETURN"/>
<xs:enumeration value="REGIONS WITH SUNSPOTS"/>
</xs:restriction>
</xs:simpleType>
</xs:element>
</xs:sequence>
</xs:complexType>

4.4.3 Complex Type: CMEType

Super-types: None

Sub-types: None

Name CMEType

Abstract no

XML Instance Representation

<...>
<location> ... </location> [1]
<time_start> Time </time_start> [1]
<time_end> Time </time_end> [0..1]
<time_onset> Time </time_onset> [0..1]
<time_onset_not_valid> xs:boolean </time_onset_not_valid> [0..1]
<time_1au> Time </time_1au> [0..1]
<duration_lift_off_h> DeltaTime </duration_lift_off_h> [0..1]
<velocity> Velocity </velocity> [1..*]
<acceleration> AccelerationType </acceleration> [0..1]
<data_gap> xs:boolean </data_gap> [0..1]
<cme_type> xs:string (*pattern* = [0ABCDEF]) </cme_type> [0..1]
<brightness> xs:string (*pattern* = B[123]) </brightness> [0..1]
<description> xs:string </description> [0..1]
<halo> xs:string (*value* comes from list: {'H2'|'H3'|'H4'|''}) </halo> [0..1]
<cme_number> [0..1]
Start Choice [1]
<soho_cme_number> xs:string </soho_cme_number> [1]
<stereoa_cme_number> xs:string </stereoa_cme_number> [1]
<stereob_cme_number> xs:string </stereob_cme_number> [1]
<seeds_cme_number> ... </seeds_cme_number> [1]
End Choice
</cme_number>
<event_detail_url> URL </event_detail_url> [0..1]
<position_description> xs:string (*value* comes from list: {'B?'|'BLimb-E'|'BLimb-N'|'BLimb-NE'|'BLimb-NW'|'BLimb-S'|'BLimb-SE'|'BLimb-SW'|'BLimb-W'|'Backside'|''})
</position_description> [0..1]
<filar> xs:string (*value* comes from list: {'DSF'|'FILA'}) </filar> [0..1]
</...>

Schema Component Representation

<xs:complexType name="CMEType">

```
<xs:sequence>
<xs:element ref="location"/>
<xs:element name="time_start" type="Time" maxOccurs="1" minOccurs="1"/>
<xs:element name="time_end" type="Time" maxOccurs="1" minOccurs="0"/>
<xs:element name="time_onset" type="Time" maxOccurs="1" minOccurs="0"/>
<xs:element name="time_onset_not_valid" type="xs:boolean" maxOccurs="1"
minOccurs="0"/>
<xs:element name="time_1au" type="Time" maxOccurs="1" minOccurs="0"/>
<xs:element name="duration_lift_off_h" type="DeltaTime" maxOccurs="1"
minOccurs="0"/>
<xs:element name="velocity" type="Velocity" maxOccurs="unbounded" minOccurs="1"/>
<xs:element name="acceleration" type="AccelerationType" maxOccurs="1"
minOccurs="0"/>
<xs:element name="data_gap" type="xs:boolean" maxOccurs="1" minOccurs="0"/>
<xs:element name="cme_type" maxOccurs="1" minOccurs="0">
<xs:simpleType>
<xs:restriction base="xs:string">
<xs:pattern value="[0ABCDEF]"/>
</xs:restriction>
</xs:simpleType>
</xs:element>
<xs:element name="brightness" maxOccurs="1" minOccurs="0">
<xs:simpleType>
<xs:restriction base="xs:string">
<xs:pattern value="B[123]"/>
</xs:restriction>
</xs:simpleType>
</xs:element>
<xs:element name="description" type="xs:string" maxOccurs="1" minOccurs="0"/>
<xs:element name="halo" maxOccurs="1" minOccurs="0">
<xs:simpleType>
<xs:restriction base="xs:string">
<xs:enumeration value="H2"/>
<xs:enumeration value="H3"/>
<xs:enumeration value="H4"/>
<xs:enumeration value=""/>
</xs:restriction>
</xs:simpleType>
</xs:element>
<xs:element name="cme_number" maxOccurs="1" minOccurs="0">
<xs:complexType>
<xs:choice>
<xs:element name="soho_cme_number" type="xs:string"/>
<xs:element name="stereoa_cme_number" type="xs:string"/>
<xs:element name="stereob_cme_number" type="xs:string"/>
<xs:element name="seeds_cme_number"/>
</xs:choice>
</xs:complexType>
</xs:element>
<xs:element name="event_detail_url" type="URL" maxOccurs="1" minOccurs="0"/>
```

<xs:element name="position_description" maxOccurs="1" minOccurs="0">
<xs:simpleType>
<xs:restriction base="xs:string">
<xs:enumeration value="B?"/>
<xs:enumeration value="BLimb-E"/>
<xs:enumeration value="BLimb-N"/>
<xs:enumeration value="BLimb-NE"/>
<xs:enumeration value="BLimb-NW"/>
<xs:enumeration value="BLimb-S"/>
<xs:enumeration value="BLimb-SE"/>
<xs:enumeration value="BLimb-SW"/>
<xs:enumeration value="BLimb-W"/>
<xs:enumeration value="Backside"/>
<xs:enumeration value=""/>
</xs:restriction>
</xs:simpleType>
</xs:element>
<xs:element name="filar" maxOccurs="1" minOccurs="0">
<xs:simpleType>
<xs:restriction base="xs:string">
<xs:enumeration value="DSF"/>
<xs:enumeration value="FILA"/>
</xs:restriction>
</xs:simpleType>
</xs:element>
</xs:sequence>
</xs:complexType>

4.4.4 Complex Type: Distance

Super-types: None

Sub-types: None

Name Distance

Abstract no

XML Instance Representation
<...>
Start Choice [1]
<distance_earth_mars_long> xs:float </distance_earth_mars_long> [1]
End Choice
</...>
Schema Component Representation
<xs:complexType name="Distance">
<xs:choice>
<xs:element name="distance_earth_mars_long" type="xs:float"/>
</xs:choice>
</xs:complexType>

4.4.5 Complex Type: EITWaveType

Super-types: None

Sub-types: None

Name EITWaveType

Abstract no

XML Instance Representation

<...>
<time_start> Time </time_start> [1]
<img_time> Time </img_time> [0..1]
<previmg_time> Time </previmg_time> [0..1]
<quality> EITQuality </quality> [0..1]
<location> ... </location> [1..*]
<velocity> Velocity </velocity> [1..*]
</...>

Schema Component Representation

```
<xs:complexType name="EITWaveType">
<xs:sequence>
<xs:element name="time_start" type="Time" maxOccurs="1" minOccurs="1"/>
<xs:element name="img_time" type="Time" maxOccurs="1" minOccurs="0"/>
<xs:element name="previmg_time" type="Time" maxOccurs="1" minOccurs="0"/>
<xs:element name="quality" type="EITQuality" maxOccurs="1" minOccurs="0"/>
<xs:element ref="location" maxOccurs="unbounded" minOccurs="1"/>
<xs:element name="velocity" type="Velocity" maxOccurs="unbounded" minOccurs="1"/>
</xs:sequence>
</xs:complexType>
```

4.4.6 Complex Type: EventList

Super-types: None

Sub-types: None

Name EventList

Abstract no

XML Instance Representation

<...>
<time_period> ... </time_period> [1]
<list_id> ID </list_id> [1]
<list_name> xs:string </list_name> [1]
<list_description> xs:string </list_description> [1]
<caviats> xs:string </caviats> [0..*]
<observatory_instrument_id> ns1:instrument </observatory_instrument_id> [1..*]
<list_type> HECListType </list_type> [1]
</...>

Schema Component Representation

```
<xs:complexType name="EventList">
<xs:sequence>
<xs:element ref="time_period" maxOccurs="1" minOccurs="1"/>
```

<xs:element name="list_id" type="ID" maxOccurs="1" minOccurs="1"/>
<xs:element name="list_name" type="xs:string" maxOccurs="1" minOccurs="1"/>
<xs:element name="list_description" type="xs:string" maxOccurs="1" minOccurs="1"/>
<xs:element name="caviats" type="xs:string" maxOccurs="unbounded" minOccurs="0"/>
<xs:element name="observatory_instrument_id" type="ns1:instrument"
maxOccurs="unbounded" minOccurs="1"/>
<xs:element name="list_type" type="HECListType" maxOccurs="1" minOccurs="1"/>
</xs:sequence>
</xs:complexType>

4.4.7 Complex Type: FlareFlagType

Super-types: None

Sub-types: None

Name FlareFlagType

Abstract no

XML Instance Representation
<...>
Start Choice [1]
<countrate_increase> xs:string </countrate_increase> [1]
<location_source> xs:string </location_source> [1]
<proton_upper_limit> xs:string </proton_upper_limit> [1]
End Choice
</...>
Schema Component Representation
<xs:complexType name="FlareFlagType">
<xs:choice maxOccurs="1" minOccurs="1">
<xs:element name="countrate_increase" type="xs:string"/>
<xs:element name="location_source" type="xs:string"/>
<xs:element name="proton_upper_limit" type="xs:string"/>
</xs:choice>
</xs:complexType>

4.4.8 Complex Type: FlareType

Super-types: None

Sub-types: None

Name FlareType

Abstract no

XML Instance Representation
<...>
<time_period> ... </time_period> [1]
<time_peak> Time </time_peak> [1]
<location> ... </location> [1]
<nar> NAR </nar> [0..1]
<magnitude> Magnitude </magnitude> [1..*]

<duration> DeltaTime </duration> [0..1]
<time_start_modifier> TimeModifier </time_start_modifier> [0..1]
<time_end_modifier> TimeModifier </time_end_modifier> [0..1]
<time_peak_modifier> TimeModifier </time_peak_modifier> [0..1]
<rhessi_flare_number> ID </rhessi_flare_number> [0..1]
<noaa_flare_number> ID </noaa_flare_number> [0..1]
<phase_angle> xs:float </phase_angle> [0..1]
<flag> FlareFlagType </flag> [0..*]
<event_detail_url> URL </event_detail_url> [0..1]
<observation_time_offset_s> xs:long </observation_time_offset_s> [0..1]
</...>
Schema Component Representation
<xs:complexType name="FlareType">
<xs:sequence>
<xs:element ref="time_period" maxOccurs="1" minOccurs="1"/>
<xs:element name="time_peak" type="Time" maxOccurs="1" minOccurs="1"/>
<xs:element ref="location" maxOccurs="1" minOccurs="1"/>
<xs:element name="nar" type="NAR" maxOccurs="1" minOccurs="0"/>
<xs:element name="magnitude" type="Magnitude" maxOccurs="unbounded"
minOccurs="1"/>
<xs:element name="duration" type="DeltaTime" maxOccurs="1" minOccurs="0"/>
<xs:element name="time_start_modifier" type="TimeModifier" maxOccurs="1"
minOccurs="0"/>
<xs:element name="time_end_modifier" type="TimeModifier" maxOccurs="1"
minOccurs="0"/>
<xs:element name="time_peak_modifier" type="TimeModifier" maxOccurs="1"
minOccurs="0"/>
<xs:element name="rhessi_flare_number" type="ID" maxOccurs="1" minOccurs="0"/>
<xs:element name="noaa_flare_number" type="ID" maxOccurs="1" minOccurs="0"/>
<xs:element name="phase_angle" type="xs:float" maxOccurs="1" minOccurs="0"/>
<xs:element name="flag" type="FlareFlagType" maxOccurs="unbounded"
minOccurs="0"/>
<xs:element name="event_detail_url" type="URL" maxOccurs="1" minOccurs="0"/>
<xs:element name="observation_time_offset_s" type="xs:long" maxOccurs="1"
minOccurs="0"/>
</xs:sequence>
</xs:complexType>

4.4.9 Complex Type: ForbushDecrease

Super-types: None

Sub-types: None

Name ForbushDecrease

Abstract no

XML Instance Representation
<...>
<time_start> Time </time_start> [1]
<flag_ssc> xs:string (*value* comes from list: {'sc'|''}) </flag_ssc> [1]

<fe_magnitude> xs:float </fe_magnitude> [1]
<kp_max> xs:float </kp_max> [1]
<b_max> xs:float </b_max> [1]
<v_solar_wind> Velocity </v_solar_wind> [1]
<axy_min> xs:float </axy_min> [1]
<az_r> xs:float </az_r> [1]
<duration_to_min> DeltaTime </duration_to_min> [1]
<duration_to_max_decrement> DeltaTime </duration_to_max_decrement> [1]
<dc_min> xs:float </dc_min> [1]
<fe_to_b> xs:float </fe_to_b> [1]
<tilt> xs:float </tilt> [1]
</...>
Schema Component Representation

```
<xs:complexType name="ForbushDecrease">
<xs:sequence>
<xs:element name="time_start" type="Time" maxOccurs="1" minOccurs="1"/>
<xs:element name="flag_ssc">
<xs:simpleType>
<xs:restriction base="xs:string">
<xs:enumeration value="sc"/>
<xs:enumeration value=""/>
</xs:restriction>
</xs:simpleType>
</xs:element>
<xs:element name="fe_magnitude" type="xs:float"/>
<xs:element name="kp_max" type="xs:float"/>
<xs:element name="b_max" type="xs:float"/>
<xs:element name="v_solar_wind" type="Velocity"/>
<xs:element name="axy_min" type="xs:float"/>
<xs:element name="az_r" type="xs:float"/>
<xs:element name="duration_to_min" type="DeltaTime"/>
<xs:element name="duration_to_max_decrement" type="DeltaTime"/>
<xs:element name="dc_min" type="xs:float"/>
<xs:element name="fe_to_b" type="xs:float"/>
<xs:element name="tilt" type="xs:float"/>
</xs:sequence>
</xs:complexType>
```

4.4.10 Complex Type: HECListType

Super-types: None

Sub-types: None

Name HECListType

Abstract no

XML Instance Representation
<...>
Start Choice [1]
<flare> FlareType </flare> [1]

<cme> CMEType </cme> [1]
<cme_insitu> InsituCMEType </cme_insitu> [1]
<magnetic_storm> MagneticStormType </magnetic_storm> [1]
<solar_energetic_proton> SolarEnergeticProtonType </solar_energetic_proton> [1]
<solar_wind_transient> SolarWindTransientEvent </solar_wind_transient> [1]
<interplanetary_shock> InterplanetaryShockType </interplanetary_shock> [1]
<radio> RadioType </radio> [1]
<eit> EITWaveType </eit> [1]
<sir> StreamInteractionRegion </sir> [1]
End Choice
</...>
Schema Component Representation
<xs:complexType name="HECListType">
<xs:choice maxOccurs="1" minOccurs="1">
<xs:element name="flare" type="FlareType"/>
<xs:element name="cme" type="CMEType"/>
<xs:element name="cme_insitu" type="InsituCMEType"/>
<xs:element name="magnetic_storm" type="MagneticStormType"/>
<xs:element name="solar_energetic_proton" type="SolarEnergeticProtonType"/>
<xs:element name="solar_wind_transient" type="SolarWindTransientEvent"/>
<xs:element name="interplanetary_shock" type="InterplanetaryShockType"/>
<xs:element name="radio" type="RadioType"/>
<xs:element name="eit" type="EITWaveType"/>
<xs:element name="sir" type="StreamInteractionRegion"/>
</xs:choice>
</xs:complexType>

4.4.11 Complex Type: HXrayType

Super-types: None

Sub-types: None

Name HXrayType

Abstract no

XML Instance Representation
<...>
Start Choice [1]
<energy_keV> xs:double </energy_keV> [1]
<hard_xray_count> Count </hard_xray_count> [1]
<energy_range_keV> ... </energy_range_keV> [0..1]
End Choice
</...>
Schema Component Representation
<xs:complexType name="HXrayType">
<xs:choice>
<xs:element name="energy_keV" type="xs:double"/>
<xs:sequence>
<xs:element name="hard_xray_count" type="Count" maxOccurs="1" minOccurs="1"/>
<xs:element name="energy_range_keV" maxOccurs="1" minOccurs="0"/>

</xs:sequence>
</xs:choice>
</xs:complexType>

4.4.12 Complex Type: IcmeFlagType

Super-types: None

Sub-types: None

Name IcmeFlagType

Abstract no

XML Instance Representation
<...>
Start Choice [1]
<icme_type> xs:string </icme_type> [1]
<icme_group> xs:string (*value* comes from list: {'1'|'2'|'3'}) </icme_group> [1]
End Choice
</...>
Schema Component Representation
<xs:complexType name="IcmeFlagType">
<xs:choice>
<xs:element name="icme_type" type="xs:string"/>
<xs:element name="icme_group">
<xs:simpleType>
<xs:restriction base="xs:string">
<xs:enumeration value="1"/>
<xs:enumeration value="2"/>
<xs:enumeration value="3"/>
</xs:restriction>
</xs:simpleType>
</xs:element>
</xs:choice>
</xs:complexType>

4.4.13 Complex Type: InsituCMEType

Super-types: None

Sub-types: None

Name InsituCMEType

Abstract no

XML Instance Representation
<...>
<plasma_magnetic_field_strength> MagneticFieldType </plasma_magnetic_field_strength> [1]
<plasma_magnetic_field_strength_error> MagneticFieldType </plasma_magnetic_field_strength_error> [0..1]
<description> xs:string </description> [0..1]

<time_start> Time </time_start> [1]
<time_end> Time </time_end> [0..1]
<velocity> Velocity </velocity> [1..*]
<magnetic_field> MagneticField </magnetic_field> [0..*]
<flag> IcmeFlagType </flag> [0..*]
<pressure> [0..*]
Start Choice [1]
<total_pressure> TotalPressure </total_pressure> [0..*]
<p_dyn_mars> xs:float </p_dyn_mars> [0..1]
<p_dyn_earth> xs:float </p_dyn_earth> [0..1]
End Choice
</pressure>
<denisty> [0..1]
Start Choice [1]
<density_max_earth> xs:float </density_max_earth> [1]
End Choice
</denisty>
<background_count_rate> [0..*]
Start Choice [1]
<counts_max_goes> ... </counts_max_goes> [1]
<counts_max_mars> ... </counts_max_mars> [1]
End Choice
</background_count_rate>
</...>
Schema Component Representation
<xs:complexType name="InsituCMEType">
<xs:sequence>
<xs:element name="plasma_magnetic_field_strength" type="MagneticFieldType"
maxOccurs="1" minOccurs="1"/>
<xs:element name="plasma_magnetic_field_strength_error" type="MagneticFieldType"
maxOccurs="1" minOccurs="0"/>
<xs:element name="description" type="xs:string" maxOccurs="1" minOccurs="0"/>
<xs:element name="time_start" type="Time" maxOccurs="1" minOccurs="1"/>
<xs:element name="time_end" type="Time" maxOccurs="1" minOccurs="0"/>
<xs:element name="velocity" type="Velocity" maxOccurs="unbounded" minOccurs="1"/>
<xs:element name="magnetic_field" type="MagneticField" maxOccurs="unbounded"
minOccurs="0"/>
<xs:element name="flag" type="IcmeFlagType" maxOccurs="unbounded"
minOccurs="0"/>
<xs:element name="pressure" maxOccurs="unbounded" minOccurs="0">
<xs:complexType>
<xs:choice>
<xs:element name="total_pressure" type="TotalPressure" maxOccurs="unbounded"
minOccurs="0"/>
<xs:element name="p_dyn_mars" type="xs:float" maxOccurs="1" minOccurs="0"/>
<xs:element name="p_dyn_earth" type="xs:float" maxOccurs="1" minOccurs="0"/>
</xs:choice>
</xs:complexType>
</xs:element>
<xs:element name="denisty" maxOccurs="1" minOccurs="0">

<xs:complexType>
<xs:choice>
<xs:element name="density_max_earth" type="xs:float"/>
</xs:choice>
</xs:complexType>
</xs:element>
<xs:element name="background_count_rate" maxOccurs="unbounded" minOccurs="0">
<xs:complexType>
<xs:choice>
<xs:element name="counts_max_goes"/>
<xs:element name="counts_max_mars"/>
</xs:choice>
</xs:complexType>
</xs:element>
</xs:sequence>
</xs:complexType>

4.4.14 Complex Type: InterplanetaryShockFlag

Super-types: None

Sub-types: None

Name InterplanetaryShockFlag

Abstract no

XML Instance Representation
<...>
Start Choice [1]
<data_available> ... </data_available> [1]
<shock_type> ... </shock_type> [1]
End Choice
</...>
Schema Component Representation
<xs:complexType name="InterplanetaryShockFlag">
<xs:choice>
<xs:element name="data_available"/>
<xs:element name="shock_type"/>
</xs:choice>
</xs:complexType>

4.4.15 Complex Type: InterplanetaryShockType

Super-types: None

Sub-types: None

Name InterplanetaryShockType

Abstract no

XML Instance Representation
<...>

<time_start> Time </time_start> [1]
<zone> xs:integer (*value* comes from list: {'0'|'1'|'2'|'4'|'10'|'20'|'30'}) </zone> [0..1]
<description> xs:string </description> [0..1]
<flag> InterplanetaryShockFlag </flag> [0..*]
<magnetic_ratio> xs:float </magnetic_ratio> [0..1]
<normal_angle> xs:float </normal_angle> [0..1]
<pressure_ratio> pressure_ratio_type </pressure_ratio> [0..1]
<velocity> Velocity </velocity> [0..*]
</...>
Schema Component Representation

```
<xs:complexType name="InterplanetaryShockType">
<xs:sequence>
<xs:element name="time_start" type="Time" maxOccurs="1" minOccurs="1"/>
<xs:element name="zone" maxOccurs="1" minOccurs="0">
<xs:simpleType>
<xs:restriction base="xs:integer">
<xs:enumeration value="0"/>
<xs:enumeration value="1"/>
<xs:enumeration value="2"/>
<xs:enumeration value="4"/>
<xs:enumeration value="10"/>
<xs:enumeration value="20"/>
<xs:enumeration value="30"/>
</xs:restriction>
</xs:simpleType>
</xs:element>
<xs:element name="description" type="xs:string" maxOccurs="1" minOccurs="0"/>
<xs:element name="flag" type="InterplanetaryShockFlag" maxOccurs="unbounded"
minOccurs="0"/>
<xs:element name="magnetic_ratio" type="xs:float" maxOccurs="1" minOccurs="0"/>
<xs:element name="normal_angle" type="xs:float" maxOccurs="1" minOccurs="0"/>
<xs:element name="pressure_ratio" type="pressure_ratio_type" maxOccurs="1"
minOccurs="0"/>
<xs:element name="velocity" type="Velocity" maxOccurs="unbounded" minOccurs="0"/>
</xs:sequence>
</xs:complexType>
```

4.4.16 Complex Type: MagneticField

Super-types: None
Sub-types: None
Name MagneticField
Abstract no
XML Instance Representation
<...>
Start Choice [1]
<b_max> MagneticFieldType </b_max> [1]
<b_max_sheath> MagneticFieldType </b_max_sheath> [1]

End Choice
</...>
Schema Component Representation
<xs:complexType name="MagneticField">
<xs:choice>
<xs:element name="b_max" type="MagneticFieldType"/>
<xs:element name="b_max_sheath" type="MagneticFieldType"/>
</xs:choice>
</xs:complexType>

4.4.17 Complex Type: MagneticStormType

Super-types: None

Sub-types: None

Name MagneticStormType

Abstract no

XML Instance Representation
<...>
<location> ... </location> [1..*]
<time_period> ... </time_period> [1]
<time_peak> Time </time_peak> [1]
<duration> DeltaTime </duration> [0..1]
<disturbance_storm_time> xs:integer </disturbance_storm_time> [0..1]
<aastar_max> xs:integer </aastar_max> [0..1]
<aastar_average> xs:integer </aastar_average> [0..1]
<aastar_sum> xs:integer </aastar_sum> [0..1]
<apstar_max> xs:integer </apstar_max> [0..1]
<apstar_average> xs:integer </apstar_average> [0..1]
<apstar_sum> xs:integer </apstar_sum> [0..1]
<number_stations_a> Count </number_stations_a> [0..1]
<number_stations_b> Count </number_stations_b> [0..1]
<number_stations_c> Count </number_stations_c> [0..1]
<number_stations_si> Count </number_stations_si> [0..1]
</...>
Schema Component Representation
<xs:complexType name="MagneticStormType">
<xs:sequence>
<xs:element ref="location" maxOccurs="unbounded" minOccurs="1"/>
<xs:element ref="time_period" maxOccurs="1" minOccurs="1"/>
<xs:element name="time_peak" type="Time" maxOccurs="1" minOccurs="1"/>
<xs:element name="duration" type="DeltaTime" maxOccurs="1" minOccurs="0"/>
<xs:element name="disturbance_storm_time" type="xs:integer" maxOccurs="1"
minOccurs="0"/>
<xs:element name="aastar_max" type="xs:integer" maxOccurs="1" minOccurs="0"/>
<xs:element name="aastar_average" type="xs:integer" maxOccurs="1" minOccurs="0"/>
<xs:element name="aastar_sum" type="xs:integer" maxOccurs="1" minOccurs="0"/>
<xs:element name="apstar_max" type="xs:integer" maxOccurs="1" minOccurs="0"/>
<xs:element name="apstar_average" type="xs:integer" maxOccurs="1" minOccurs="0"/>

<xs:element name="apstar_sum" type="xs:integer" maxOccurs="1" minOccurs="0"/>
<xs:element name="number_stations_a" type="Count" maxOccurs="1" minOccurs="0"/>
<xs:element name="number_stations_b" type="Count" maxOccurs="1" minOccurs="0"/>
<xs:element name="number_stations_c" type="Count" maxOccurs="1" minOccurs="0"/>
<xs:element name="number_stations_si" type="Count" maxOccurs="1" minOccurs="0"/>
</xs:sequence>
</xs:complexType>

4.4.18 Complex Type: Magnitude

Super-types: None

Sub-types: None

Name Magnitude

Abstract no

XML Instance Representation
<...>
Start Choice [1]
<xray_class> XrayType </xray_class> [1]
<optical_class> OpticalType </optical_class> [1]
<hard_xray_quantifier> HXrayType </hard_xray_quantifier> [1]
<xray_class_error> XrayType </xray_class_error> [1]
<see_xps_index> xs:float </see_xps_index> [1]
<see_egs_index> xs:float </see_egs_index> [1]
End Choice
</...>
Schema Component Representation
<xs:complexType name="Magnitude">
<xs:choice>
<xs:element name="xray_class" type="XrayType"/>
<xs:element name="optical_class" type="OpticalType"/>
<xs:element name="hard_xray_quantifier" type="HXrayType"/>
<xs:element name="xray_class_error" type="XrayType"/>
<xs:element name="see_xps_index" type="xs:float"/>
<xs:element name="see_egs_index" type="xs:float"/>
</xs:choice>
</xs:complexType>

4.4.19 Complex Type: PressureType

Super-types: None

Sub-types: None

Name PressureType

Abstract no

XML Instance Representation
<...>
Start Choice [1]

<p_pPa> ... </p_pPa> [1]
End Choice
</...>
Schema Component Representation
<xs:complexType name="PressureType">
<xs:choice>
<xs:element name="p_pPa"/>
</xs:choice>
</xs:complexType>

4.4.20 Complex Type: RadioType

Super-types: None
Sub-types: None
Name RadioType
Abstract no
XML Instance Representation
<...>
<radio_245mhz> xs:integer </radio_245mhz> [0..1]
<radio_10cm> xs:integer </radio_10cm> [0..1]
<radio_seep_ii> xs:boolean </radio_seep_ii> [0..1]
<radio_seep_iv> xs:boolean </radio_seep_iv> [0..1]
<shortwave_fade> ... </shortwave_fade> [0..1]
<frequency> xs:integer </frequency> [0..1]
<frequency_start> xs:integer </frequency_start> [0..1]
<frequency_end> xs:integer </frequency_end> [0..1]
<circular_polarization_percent> xs:integer </circular_polarization_percent> [0..1]
<polarization_direction> xs:string (*pattern* = [LR]) </polarization_direction> [0..1]
<sfu_max> xs:float </sfu_max> [0..1]
<radio_class> xs:string </radio_class> [0..1]
<data_url> URL </data_url> [0..1]
<dyn_spectra> URL </dyn_spectra> [0..1]
</...>
Schema Component Representation
<xs:complexType name="RadioType">
<xs:sequence>
<xs:element name="radio_245mhz" type="xs:integer" maxOccurs="1" minOccurs="0"/>
<xs:element name="radio_10cm" type="xs:integer" maxOccurs="1" minOccurs="0"/>
<xs:element name="radio_seep_ii" type="xs:boolean" maxOccurs="1" minOccurs="0"/>
<xs:element name="radio_seep_iv" type="xs:boolean" maxOccurs="1" minOccurs="0"/>
<xs:element name="shortwave_fade" maxOccurs="1" minOccurs="0"/>
<xs:element name="frequency" type="xs:integer" maxOccurs="1" minOccurs="0"/>
<xs:element name="frequency_start" type="xs:integer" maxOccurs="1" minOccurs="0"/>
<xs:element name="frequency_end" type="xs:integer" maxOccurs="1" minOccurs="0"/>
<xs:element name="circular_polarization_percent" type="xs:integer" maxOccurs="1"
minOccurs="0"/>
<xs:element name="polarization_direction" maxOccurs="1" minOccurs="0">
<xs:simpleType>

<xs:restriction base="xs:string">
<xs:pattern value="[LR]"/>
</xs:restriction>
</xs:simpleType>
</xs:element>
<xs:element name="sfu_max" type="xs:float" maxOccurs="1" minOccurs="0"/>
<xs:element name="radio_class" type="xs:string" maxOccurs="1" minOccurs="0"/>
<xs:element name="data_url" type="URL" maxOccurs="1" minOccurs="0"/>
<xs:element name="dyn_spectra" type="URL" maxOccurs="1" minOccurs="0"/>
</xs:sequence>
</xs:complexType>

4.4.21 Complex Type: SirFlagType

Super-types: None

Sub-types: None

Name SirFlagType

Abstract no

XML Instance Representation
<...>
Start Choice [1]
<sir_type> ... </sir_type> [1]
<shock_type> ... </shock_type> [1]
End Choice
</...>
Schema Component Representation
<xs:complexType name="SirFlagType">
<xs:choice>
<xs:element name="sir_type"/>
<xs:element name="shock_type"/>
</xs:choice>
</xs:complexType>

4.4.22 Complex Type: SolarEnergeticProtonType

Super-types: None

Sub-types: None

Name SolarEnergeticProtonType

Abstract no

XML Instance Representation
<...>
<start_time> Time </start_time> [1]
<time_peak> Time </time_peak> [1]
<nar> NAR </nar> [1]
<location> ... </location> [1..*]
<proton_flux> Count </proton_flux> [1]

<associated_cme> ... </associated_cme> [1]
<associated_flare_peak> Time </associated_flare_peak> [1]
<magnitude> Magnitude </magnitude> [1..*]
</...>
Schema Component Representation
<xs:complexType name="SolarEnergeticProtonType">
<xs:sequence>
<xs:element name="start_time" type="Time" maxOccurs="1" minOccurs="1"/>
<xs:element name="time_peak" type="Time" maxOccurs="1" minOccurs="1"/>
<xs:element name="nar" type="NAR"/>
<xs:element ref="location" maxOccurs="unbounded" minOccurs="1"/>
<xs:element name="proton_flux" type="Count"/>
<xs:element name="associated_cme"/>
<xs:element name="associated_flare_peak" type="Time"/>
<xs:element name="magnitude" type="Magnitude" maxOccurs="unbounded"
minOccurs="1"/>
</xs:sequence>
</xs:complexType>

4.4.23 Complex Type: SolarStatistics

Super-types: None

Sub-types: None

Name SolarStatistics

Abstract no

XML Instance Representation
<...>
<time_start> Time </time_start> [1]
<radio_flux_10cm> Count </radio_flux_10cm> [1]
<number_sunspots> Count </number_sunspots> [1]
<sunspot_area> xs:integer </sunspot_area> [1]
<number_new_regions> Count </number_new_regions> [1]
<stanford_solar_mean_field> xs:integer </stanford_solar_mean_field> [0..1]
<xray_bkg_flux> Magnitude </xray_bkg_flux> [1]
<number_c_flares> Count </number_c_flares> [1]
<number_m_flares> Count </number_m_flares> [1]
<number_x_flares> Count </number_x_flares> [1]
<number_opts_flares> Count </number_opts_flares> [1]
<number_opt1_flares> Count </number_opt1_flares> [1]
<number_opt2_flares> Count </number_opt2_flares> [1]
<number_opt3_flares> Count </number_opt3_flares> [1]
</...>
Schema Component Representation
<xs:complexType name="SolarStatistics">
<xs:sequence>
<xs:element name="time_start" type="Time" maxOccurs="1" minOccurs="1"/>
<xs:element name="radio_flux_10cm" type="Count" maxOccurs="1" minOccurs="1"/>
<xs:element name="number_sunspots" type="Count" maxOccurs="1" minOccurs="1"/>

<xs:element name="sunspot_area" type="xs:integer" maxOccurs="1" minOccurs="1"/>
<xs:element name="number_new_regions" type="Count" maxOccurs="1" minOccurs="1"/>
<xs:element name="stanford_solar_mean_field" type="xs:integer" maxOccurs="1" minOccurs="0"/>
<xs:element name="xray_bkg_flux" type="Magnitude" maxOccurs="1" minOccurs="1"/>
<xs:element name="number_c_flares" type="Count" maxOccurs="1" minOccurs="1"/>
<xs:element name="number_m_flares" type="Count" maxOccurs="1" minOccurs="1"/>
<xs:element name="number_x_flares" type="Count" maxOccurs="1" minOccurs="1"/>
<xs:element name="number_opts_flares" type="Count" maxOccurs="1" minOccurs="1"/>
<xs:element name="number_opt1_flares" type="Count" maxOccurs="1" minOccurs="1"/>
<xs:element name="number_opt2_flares" type="Count" maxOccurs="1" minOccurs="1"/>
<xs:element name="number_opt3_flares" type="Count" maxOccurs="1" minOccurs="1"/>
</xs:sequence>
</xs:complexType>

4.4.24 Complex Type: SolarWindTransientEvent

Super-types: None

Sub-types: None

Name SolarWindTransientEvent

Abstract no

XML Instance Representation
<...>
<time_period> ... </time_period> [1]
<time_1au> Time </time_1au> [0..1]
<location> ... </location> [0..*]
<velocity_proton> Velocity </velocity_proton> [0..1]
<velocity_proton_error> Velocity </velocity_proton_error> [0..1]
<description> xs:string </description> [1]
<instsrument> ns1:instrument </instsrument> [0..*]
<data_h12> Time </data_h12> [0..1]
<category> SolarWindCategory </category> [0..*]
<magnetic_cloud_id> xs:float </magnetic_cloud_id> [0..1]
<magnetic_cloud_quality> xs:integer (1 < *value* <= 3) </magnetic_cloud_quality> [1]
<ip_shock_zone> xs:integer (0 < *value* <= 4) </ip_shock_zone> [0..1]
</...>
Schema Component Representation
<xs:complexType name="SolarWindTransientEvent">
<xs:sequence>
<xs:element ref="time_period" maxOccurs="1" minOccurs="1"/>
<xs:element name="time_1au" type="Time" maxOccurs="1" minOccurs="0"/>
<xs:element ref="location" maxOccurs="unbounded" minOccurs="0"/>
<xs:element name="velocity_proton" type="Velocity" maxOccurs="1" minOccurs="0"/>
<xs:element name="velocity_proton_error" type="Velocity" maxOccurs="1" minOccurs="0"/>
<xs:element name="description" type="xs:string"/>
<xs:element name="instsrument" type="ns1:instrument" maxOccurs="unbounded" minOccurs="0"/>

<xs:element name="data_h12" type="Time" maxOccurs="1" minOccurs="0"/>
<xs:element name="category" type="SolarWindCategory" maxOccurs="unbounded" minOccurs="0"/>
<xs:element name="magnetic_cloud_id" type="xs:float" maxOccurs="1" minOccurs="0"/>
<xs:element name="magnetic_cloud_quality">
<xs:simpleType>
<xs:restriction base="xs:integer">
<xs:maxInclusive value="3"/>
<xs:minExclusive value="1"/>
</xs:restriction>
</xs:simpleType>
</xs:element>
<xs:element name="ip_shock_zone" maxOccurs="1" minOccurs="0">
<xs:simpleType>
<xs:restriction base="xs:integer">
<xs:maxInclusive value="4"/>
<xs:minExclusive value="0"/>
</xs:restriction>
</xs:simpleType>
</xs:element>
</xs:sequence>
</xs:complexType>

4.4.25 Complex Type: StreamInteractionRegion

Super-types: None

Sub-types: None

Name StreamInteractionRegion

Abstract no

XML Instance Representation
<...>
<time_period> ... </time_period> [1]
<velocity> Velocity </velocity> [1..*]
<total_pressure> TotalPressure </total_pressure> [1..*]
<magnetic_field> MagneticField </magnetic_field> [1..*]
<flag> SirFlagType </flag> [0..*]
<np_max> xs:float </np_max> [0..1]
</...>
Schema Component Representation
<xs:complexType name="StreamInteractionRegion">
<xs:sequence>
<xs:element ref="time_period" maxOccurs="1" minOccurs="1"/>
<xs:element name="velocity" type="Velocity" maxOccurs="unbounded" minOccurs="1"/>
<xs:element name="total_pressure" type="TotalPressure" maxOccurs="unbounded" minOccurs="1"/>
<xs:element name="magnetic_field" type="MagneticField" maxOccurs="unbounded" minOccurs="1"/>
<xs:element name="flag" type="SirFlagType" maxOccurs="unbounded" minOccurs="0"/>

<xs:element name="np_max" type="xs:float" maxOccurs="1" minOccurs="0"/>
</xs:sequence>
</xs:complexType>

4.4.26 Complex Type: TotalPressure

Super-types: None

Sub-types: None

Name TotalPressure

Abstract no

XML Instance Representation
<...>
Start Choice [1]
<pt> PressureType </pt> [0..1]
<pt_max> PressureType </pt_max> [0..1]
<pt_max_sheath> PressureType </pt_max_sheath> [0..1]
End Choice
</...>
Schema Component Representation
<xs:complexType name="TotalPressure">
<xs:choice>
<xs:element name="pt" type="PressureType" maxOccurs="1" minOccurs="0"/>
<xs:element name="pt_max" type="PressureType" maxOccurs="1" minOccurs="0"/>
<xs:element name="pt_max_sheath" type="PressureType" maxOccurs="1"
minOccurs="0"/>
</xs:choice>
</xs:complexType>

4.4.27 Complex Type: Velocity

Super-types: None

Sub-types: None

Name Velocity

Abstract no

XML Instance Representation
<...>
Start Choice [1]
<v> VelocityType </v> [1]
<v_min> VelocityType </v_min> [1]
<v_max> VelocityType </v_max> [1]
<v_max_sheath> VelocityType </v_max_sheath> [1]
<v_max_earth> VelocityType </v_max_earth> [1]
<v_init> VelocityType </v_init> [1]
<v_20r> VelocityType </v_20r> [1]
<v_final> VelocityType </v_final> [1]
<v_proton> VelocityType </v_proton> [1]

<v_projected> VelocityType </v_projected> [1]
<v_uncertainty_factor> xs:float </v_uncertainty_factor> [1]
<v_plane_of_sky> VelocityType </v_plane_of_sky> [1]
<dv> VelocityType </dv> [1]
<dv_time> VelocityType </dv_time> [1]
<magnetosonic_mach_number> ... </magnetosonic_mach_number> [1]
End Choice
</...>
Schema Component Representation

```
<xs:complexType name="Velocity">
<xs:choice maxOccurs="1">
<xs:element name="v" type="VelocityType" maxOccurs="1"/>
<xs:element name="v_min" type="VelocityType" maxOccurs="1"/>
<xs:element name="v_max" type="VelocityType" maxOccurs="1"/>
<xs:element name="v_max_sheath" type="VelocityType" maxOccurs="1"/>
<xs:element name="v_max_earth" type="VelocityType" maxOccurs="1"/>
<xs:element name="v_init" type="VelocityType" maxOccurs="1"/>
<xs:element name="v_20r" type="VelocityType" maxOccurs="1"/>
<xs:element name="v_final" type="VelocityType" maxOccurs="1"/>
<xs:element name="v_proton" type="VelocityType" maxOccurs="1"/>
<xs:element name="v_projected" type="VelocityType" maxOccurs="1"/>
<xs:element name="v_uncertainty_factor" type="xs:float" maxOccurs="1"/>
<xs:element name="v_plane_of_sky" type="VelocityType" maxOccurs="1"/>
<xs:element name="dv" type="VelocityType" maxOccurs="1"/>
<xs:element name="dv_time" type="VelocityType" maxOccurs="1"/>
<xs:element name="magnetosonic_mach_number" maxOccurs="1" minOccurs="1"/>
</xs:choice>
</xs:complexType>
```

4.4.28 Complex Type: VelocityType

Super-types: None

Sub-types: None

Name VelocityType

Abstract no

XML Instance Representation
<...>
Start Choice [1]
<v_kms-1> xs:float </v_kms-1> [1]
<v_ms-1> xs:float </v_ms-1> [1]
End Choice
</...>
Schema Component Representation

```
<xs:complexType name="VelocityType">
<xs:choice>
<xs:element name="v_kms-1" type="xs:float"/>
<xs:element name="v_ms-1" type="xs:float"/>
</xs:choice>
```

</xs:complexType>

4.4.29 Complex Type: pressure_ratio_type

Super-types: None

Sub-types: None

Name pressure_ratio_type

Abstract no

XML Instance Representation
<...>
Start Choice [1]
<data_gap> xs:string (*value* comes from list: {'dg'}) </data_gap> [1]
<ratio> xs:float </ratio> [1]
End Choice
</...>
Schema Component Representation
<xs:complexType name="pressure_ratio_type">
<xs:choice>
<xs:element name="data_gap">
<xs:simpleType>
<xs:restriction base="xs:string">
<xs:enumeration value="dg"/>
</xs:restriction>
</xs:simpleType>
</xs:element>
<xs:element name="ratio" type="xs:float"/>
</xs:choice>
</xs:complexType>

4.4.30 Simple Type: EITQuality

Super-types: xs:string < **EITQuality** (by restriction)

Sub-types: None

Name EITQuality

- Base XSD Type: string

Content

- *pattern* = Q[0-5][S]?

Schema Component Representation
<xs:simpleType name="EITQuality">
<xs:restriction base="xs:string">
<xs:pattern value="Q[0-5][S]?"/>
</xs:restriction>
</xs:simpleType>

4.4.31 Simple Type: MagneticClass

Super-types: xs:string < **MagneticClass** (by restriction)

Sub-types: None

Name MagneticClass

- Base XSD Type: string

Content

- *value* comes from list: {'ALPHA'|'BETA'|'BETA-DELTA'|'BETA-GAMMA'|'BETA-GAMMA-DELTA'|'GAMMA'|'GAMMA-DELTA'}

Schema Component Representation

```
<xs:simpleType name="MagneticClass">
<xs:restriction base="xs:string">
<xs:enumeration value="ALPHA"/>
<xs:enumeration value="BETA"/>
<xs:enumeration value="BETA-DELTA"/>
<xs:enumeration value="BETA-GAMMA"/>
<xs:enumeration value="BETA-GAMMA-DELTA"/>
<xs:enumeration value="GAMMA"/>
<xs:enumeration value="GAMMA-DELTA"/>
</xs:restriction>
</xs:simpleType>
```

4.4.32 Simple Type: OpticalType

Super-types: xs:string < **OpticalType** (by restriction)

Sub-types: None

Name OpticalType

- Base XSD Type: string

Content

- *value* comes from list: {'0b'|'0f'|'0n'|'1'|'1b'|'1f'|'1n'|'2b'|'2f'|'2n'|'3'|'3b'|'3f'|'3n'|'4'|'4b'|'4f'|'4n'|'an'|'b'|'bsl'|'c3'|'dsf'|'epl'|'n'|'n2'|'s'|'if'|'in'|'on'|'rb'|'sb'|'sf'|'SF'|'sn'|'sv'|'sx'|'h'}

Schema Component Representation

```
<xs:simpleType name="OpticalType">
<xs:restriction base="xs:string">
<xs:enumeration value="0b"/>
<xs:enumeration value="0f"/>
<xs:enumeration value="0n"/>
<xs:enumeration value="1"/>
<xs:enumeration value="1b"/>
<xs:enumeration value="1f"/>
<xs:enumeration value="1n"/>
<xs:enumeration value="2b"/>
<xs:enumeration value="2f"/>
```

<xs:enumeration value="2n"/>
<xs:enumeration value="3"/>
<xs:enumeration value="3b"/>
<xs:enumeration value="3f"/>
<xs:enumeration value="3n"/>
<xs:enumeration value="4"/>
<xs:enumeration value="4b"/>
<xs:enumeration value="4f"/>
<xs:enumeration value="4n"/>
<xs:enumeration value="an"/>
<xs:enumeration value="b"/>
<xs:enumeration value="bsl"/>
<xs:enumeration value="c3"/>
<xs:enumeration value="dsf"/>
<xs:enumeration value="epl"/>
<xs:enumeration value="n"/>
<xs:enumeration value="n2"/>
<xs:enumeration value="s"/>
<xs:enumeration value="if"/>
<xs:enumeration value="in"/>
<xs:enumeration value="on"/>
<xs:enumeration value="rb"/>
<xs:enumeration value="sb"/>
<xs:enumeration value="sf"/>
<xs:enumeration value="SF"/>
<xs:enumeration value="sn"/>
<xs:enumeration value="sv"/>
<xs:enumeration value="sx"/>
<xs:enumeration value="h"/>
</xs:restriction>
</xs:simpleType>

4.4.33 Simple Type: SolarWindCategory

Super-types: xs:string < **SolarWindCategory** (by restriction)

Sub-types: None

Name SolarWindCategory

- Base XSD Type: string

Content

- *value* comes from list: {'BzN'|'BzS'|'EyC'|'HSS'|'IMC'|'IR'|'IS'|'LSS'|'MISC'|'PC'|'SBC'}

Schema Component Representation
<xs:simpleType name="SolarWindCategory">
<xs:restriction base="xs:string">
<xs:enumeration value="BzN"/>
<xs:enumeration value="BzS"/>
<xs:enumeration value="EyC"/>

<xs:enumeration value="HSS"/>
<xs:enumeration value="IMC"/>
<xs:enumeration value="IR"/>
<xs:enumeration value="IS"/>
<xs:enumeration value="LSS"/>
<xs:enumeration value="MISC"/>
<xs:enumeration value="PC"/>
<xs:enumeration value="SBC"/>
</xs:restriction>
</xs:simpleType>

4.4.34 Simple Type: TimeModifier

Super-types: xs:string < **TimeModifier** (by restriction)

Sub-types: None

Name TimeModifier

- Base XSD Type: string

Content

- *pattern* = [DEU]

Schema Component Representation
<xs:simpleType name="TimeModifier">
<xs:restriction base="xs:string">
<xs:pattern value="[DEU]"/>
</xs:restriction>
</xs:simpleType>

4.4.35 Simple Type: XrayType

Super-types: xs:string < **XrayType** (by restriction)

Sub-types: None

Name XrayType

- Base XSD Type: string

Content

- *pattern* = [BCMX][1-9](.[0-9])?

Schema Component Representation
<xs:simpleType name="XrayType">
<xs:restriction base="xs:string">
<xs:pattern value="[BCMX][1-9](.[0-9])?"/>
<xs:pattern value="X[1-9][0-9](.[0-9])?"/>
</xs:restriction>
</xs:simpleType>

4.4.36 Simple Type: ZurichClass

Super-types: xs:string < **ZurichClass** (by restriction)

Sub-types: None

Name ZurichClass

- Base XSD Type: string

Content

- *pattern* = [A-FH]

Schema Component Representation
<xs:simpleType name="ZurichClass">
<xs:restriction base="xs:string">
<xs:pattern value="[A-FH]"/>
</xs:restriction>
</xs:simpleType>

---

5 HFC

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- Complex Type: **TypeIIType**
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- Simple Type: **LevelOfTrustType**
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- Simple Type: **TrackingIDType**

5.2 Schema Document Properties

Target Namespace None

Element and Attribute Namespaces	• Global element and attribute declarations belong to this schema's target namespace. • By default, local element declarations have no namespace. • By default, local attribute declarations have no namespace.

Schema Composition	• This schema imports schema(s) from the following namespace(s):
	  ○ *http://helio-vo.eu/xml/Instruments/v0.1* (at http://www.helio-vo.eu/services/xml/instruments.xsd)
	• This schema includes components from the following schema document(s):
	  ○ helio_data_model-generalTypes.xsd

5.2.1 Declared Namespaces

Prefix	Namespace

xml http://www.w3.org/XML/1998/namespace
xs http://www.w3.org/2001/XMLSchema
ns1 http://helio-vo.eu/xml/Instruments/v0.1
Schema Component Representation
<xs:schema>
<xs:import namespace="http://helio-vo.eu/xml/Instruments/v0.1"
schemaLocation="http://www.helio-vo.eu/services/xml/instruments.xsd"/>
<xs:include schemaLocation="helio_data_model-generalTypes.xsd"/>
...
</xs:schema>

5.3 Global Declarations

5.3.1 Element: ar

Name ar
Type ARType
Nillable no
Abstract no
XML Instance Representation
<ar>
<image> ImageType </image> [1]
<feature> FeatureType </feature> [1]
<skeleton_centre> Location </skeleton_centre> [1..*]
<neutral_line_length_Mm> xs:float </neutral_line_length_Mm> [1]
<strong_gradient_length> xs:float </strong_gradient_length> [1]
<max_gradient> xs:float </max_gradient> [1]
<mean_gradient> xs:float </mean_gradient> [1]
<median_gradient> xs:float </median_gradient> [1]
<r_schrijver> xs:float </r_schrijver> [0..1]
<wlsg> xs:float </wlsg> [0..1]
<noaa_number> xs:integer </noaa_number> [0..1]
<id> ID </id> [1]
<noaa_solar_region_id> ID </noaa_solar_region_id> [0..1]
</ar>
Schema Component Representation
<xs:element name="ar" type="ARType"/>

5.3.2 Element: ar_tracking

Name ar_tracking
Type TrackingType
Nillable no
Abstract no
XML Instance Representation

<ar_tracking>
<id> ID </id> [1]
<level_of_trust> LevelOfTrustType </level_of_trust> [0..1]
<behaviour_code> xs:int </behaviour_code> [1]
<tracking_id> TrackingIDType </tracking_id> [1]
<previous_tracking_id> TrackingIDType </previous_tracking_id> [0..1]
<feature> FeatureType </feature> [1]
</ar_tracking>
Schema Component Representation
<xs:element name="ar_tracking" type="TrackingType"/>

5.3.3 Element: ch

Name ch
Type CHType
Nillable no
Abstract no
XML Instance Representation
<ch>
<image> ImageType </image> [1]
<feature> FeatureType </feature> [1]
<image_id> xs:integer </image_id> [1]
<image_group_id> xs:integer </image_group_id> [1]
<threshold> xs:double </threshold> [1]
<size> Location </size> [1..*]
<id> xs:integer </id> [1]
<coronal_hole_partof_group> CHType </coronal_hole_partof_group> [0..*]
</ch>
Schema Component Representation
<xs:element name="ch" type="CHType"/>

5.3.4 Element: ch_group

Name ch_group
Type CHType
Nillable no
Abstract no
XML Instance Representation
<ch_group>
<image> ImageType </image> [1]
<feature> FeatureType </feature> [1]
<image_id> xs:integer </image_id> [1]
<image_group_id> xs:integer </image_group_id> [1]
<threshold> xs:double </threshold> [1]
<size> Location </size> [1..*]
<id> xs:integer </id> [1]

<coronal_hole_partof_group> CHType </coronal_hole_partof_group> [0..*]
</ch_group>
Schema Component Representation
<xs:element name="ch_group" type="CHType"/>

5.3.5 Element: ch_tracking

Name ch_tracking
Type TrackingType
Nillable no
Abstract no
XML Instance Representation
<ch_tracking>
<id> ID </id> [1]
<level_of_trust> LevelOfTrustType </level_of_trust> [0..1]
<behaviour_code> xs:int </behaviour_code> [1]
<tracking_id> TrackingIDType </tracking_id> [1]
<previous_tracking_id> TrackingIDType </previous_tracking_id> [0..1]
<feature> FeatureType </feature> [1]
</ch_tracking>
Schema Component Representation
<xs:element name="ch_tracking" type="TrackingType"/>

5.3.6 Element: feature

Name feature
Type FeatureType
Nillable no
Abstract no
XML Instance Representation
<feature>

 BoundingRectangle </br> [1..*]
<centre> Location </centre> [0..*]
<area> Area </area> [1]
<max_bz> IntensityType </max_bz> [0..1]
<min_bz> IntensityType </min_bz> [0..1]
<mean_bz> IntensityType </mean_bz> [0..1]
<total_bz> IntensityType </total_bz> [0..1]
<abs_total_bz> IntensityType </abs_total_bz> [0..1]
<skew_bz> IntensityType </skew_bz> [0..1]
<mean_intensitiy_2quiet_sun> xs:double </mean_intensitiy_2quiet_sun> [0..1]
<chain_code> ChainCodeType </chain_code> [1]
<snapshot> URL </snapshot> [1]
<max_intensity> PhotoIntensityType </max_intensity> [1]
<min_intensity> PhotoIntensityType </min_intensity> [0..1]
<mean_intensity> PhotoIntensityType </mean_intensity> [1]

<output_file_name> xs:string </output_file_name> [0..1]
<source_file_name> xs:string </source_file_name> [0..1]
<original_file_name> xs:string </original_file_name> [0..1]
<run_time> Time </run_time> [1]
<quiet_sun_intensity> xs:int </quiet_sun_intensity> [0..1]
</feature>
Schema Component Representation
<xs:element name="feature" type="FeatureType"/>

5.3.7 Element: feature_recognision_code

Name feature_recognision_code
Type FeatureRecognisionCodeType
Nillable no
Abstract no
XML Instance Representation
<feature_recognision_code>
<feature_name> xs:string </feature_name> [0..1]
<code_id> ID </code_id> [1]
<institute> xs:string </institute> [1]
<code_name> xs:string </code_name> [1]
<version> xs:string </version> [1]
<encoding> xs:string </encoding> [0..1]
<person> xs:string </person> [1]
<email> Email </email> [1]
<reference> xs:string </reference> [0..*]
</feature_recognision_code>
Schema Component Representation
<xs:element name="feature_recognision_code" type="FeatureRecognisionCodeType"/>

5.3.8 Element: filament

Name filament
Type FilamentType
Nillable no
Abstract no
XML Instance Representation
<filament>
<image> ImageType </image> [1]
<feature> FeatureType </feature> [1]
<skeleton> SkeletonType </skeleton> [1]
<elongation> xs:float </elongation> [1]
<orientation> ... </orientation> [1]
<id> ID </id> [1]
</filament>
Schema Component Representation

<xs:element name="filament" type="FilamentType"/>

5.3.9 Element: filament_tracking

Name filament_tracking
Type TrackingType
Nillable no
Abstract no
XML Instance Representation
<filament_tracking>
<id> ID </id> [1]
<level_of_trust> LevelOfTrustType </level_of_trust> [0..1]
<behaviour_code> xs:int </behaviour_code> [1]
<tracking_id> TrackingIDType </tracking_id> [1]
<previous_tracking_id> TrackingIDType </previous_tracking_id> [0..1]
<feature> FeatureType </feature> [1]
</filament_tracking>
Schema Component Representation
<xs:element name="filament_tracking" type="TrackingType"/>

5.3.10 Element: hfc

Name hfc
Type FeatureList
Nillable no
Abstract no
XML Instance Representation
<hfc>
<time_period> ... </time_period> [1]
<list_id> ID </list_id> [1]
<list_name> xs:string </list_name> [1]
<list_description> xs:string </list_description> [1]
<caviats> xs:string </caviats> [0..*]
<list_type> HFCListType </list_type> [1]
<instsrument> ns1:instrument </instsrument> [1..*]
<encoding_method> EMType </encoding_method> [1]
</hfc>
Schema Component Representation
<xs:element name="hfc" type="FeatureList"/>

5.3.11 Element: image

Name image
Type ImageType

Nillable no

Abstract no

XML Instance Representation
<image>
<time_obs> Time </time_obs> [1]
<time_prev_obs> Time </time_prev_obs> [0..1]
<rot_carr> Location </rot_carr> [1]
<spacial_scale> SpatialScale </spacial_scale> [1]
<bitpix> xs:integer (*value* comes from list: {'8'|'16'|'32'|'-32'|'-64'}) </bitpix> [1]
<bscale> xs:integer </bscale> [1]
<bzero> xs:integer </bzero> [1]
<naxis_x> xs:integer </naxis_x> [1]
<naxis_y> xs:integer </naxis_y> [1]
<centre_sun> Location </centre_sun> [1]
<radius_sun_pix> xs:double </radius_sun_pix> [1]
<org_image> URL </org_image> [0..1]
<julian_date_obs> JulianDate </julian_date_obs> [0..1]
<exposure_time_s> xs:float </exposure_time_s> [0..1]
<bscale> xs:double </bscale> [0..1]
<bzero> xs:double </bzero> [0..1]
<quality> xs:string </quality> [0..1]
<filename> xs:string </filename> [0..1]
<comment> xs:string </comment> [0..1]
</image>
Schema Component Representation
<xs:element name="image" type="ImageType"/>

5.3.12 Element: observation

Name observation

Type ObservationType

Nillable no

Abstract no

XML Instance Representation
<observation>
<image> ImageType </image> [1]
<carrington_rotation> CarringtonType </carrington_rotation> [1]
<time_period> TimePeriod </time_period> [1]
<exposure_time_s> xs:float </exposure_time_s> [0..1]
<file_format> xs:string </file_format> [0..1]
<original_file_name> xs:string </original_file_name> [0..1]
<id> ID </id> [1]
<url_orig_file> URL </url_orig_file> [0..1]
<quick_look_file_name> xs:string </quick_look_file_name> [0..1]
<url_quick_look_file> URL </url_quick_look_file> [0..1]
<quality> ... </quality> [0..1]
<local_file_path> xs:string </local_file_path> [0..1]

</observation>
Schema Component Representation
<xs:element name="observation" type="ObservationType"/>

5.3.13 Element: observatory

Name observatory
Type ObservatoryType
Nillable no
Abstract no
XML Instance Representation
<observatory>
<observatory> xs:string </observatory> [1]
<instrument> xs:string </instrument> [1]
<telescope> xs:string </telescope> [1]
<observatory_instrument_id> ns1:instrument </observatory_instrument_id> [1]
<id> ID </id> [1]
<observatory_type> xs:string (*value* comes from list: {'Remote-sensing'|'in situ'}) </observatory_type> [0..1]
<unit> xs:string (*value* comes from list: {'Gauss'|'Counts'|'dB above background'|'SFU'}) </unit> [0..1]
<spectral_name> xs:string (*value* comes from list: {'Line_of_sight magnetic field'|'Extreme ultraviolet'|'Radio'|'visible'}) </spectral_name> [0..1]
<wave_unit> xs:string (*value* comes from list: {'nm'|'MHz'}) </wave_unit> [1]
<wave_name> xs:string </wave_name> [0..1]
<wave_min> xs:float </wave_min> [1]
<wave_max> xs:float </wave_max> [1]
</observatory>
Schema Component Representation
<xs:element name="observatory" type="ObservatoryType"/>

5.3.14 Element: preprocessing_code

Name preprocessing_code
Type FeatureRecognisionCodeType
Nillable no
Abstract no
XML Instance Representation
<preprocessing_code>
<feature_name> xs:string </feature_name> [0..1]
<code_id> ID </code_id> [1]
<institute> xs:string </institute> [1]
<code_name> xs:string </code_name> [1]
<version> xs:string </version> [1]
<encoding> xs:string </encoding> [0..1]
<person> xs:string </person> [1]

<email> Email </email> [1]
<reference> xs:string </reference> [0..*]
</preprocessing_code>
Schema Component Representation
<xs:element name="preprocessing_code" type="FeatureRecognisionCodeType"/>

5.3.15 Element: preprocessing_output

Name preprocessing_output
Type PreprocessingOutputType
Nillable no
Abstract no
XML Instance Representation
<preprocessing_output>
<background_cleaning> xs:boolean </background_cleaning> [1]
<algebraic_error_pix> xs:int </algebraic_error_pix> [0..1]
<bits_per_pixel> xs:int </bits_per_pixel> [1]
<division_to_normalise> xs:boolean </division_to_normalise> [1]
<ellipse_fitting> xs:boolean </ellipse_fitting> [0..1]
<ellipse> EllipseType </ellipse> [0..1]
<id> ID </id> [1]
<normalizing_parameter> xs:float </normalizing_parameter> [0..1]
<limb_darkening_removal> xs:boolean </limb_darkening_removal> [0..1]
<line_cleaning> xs:boolean </line_cleaning> [0..1]
<line_cleaning_direction_deg> xs:float </line_cleaning_direction_deg> [0..1]
<image> ImageType </image> [1]
<standardisation> xs:boolean </standardisation> [0..1]
<standard_deviation> xs:float </standard_deviation> [0..1]
<geometric_standard_deviation> xs:float </geometric_standard_deviation> [0..1]
</preprocessing_output>
Schema Component Representation
<xs:element name="preprocessing_output" type="PreprocessingOutputType"/>

5.3.16 Element: prominence

Name prominence
Type ProminenceType
Nillable no
Abstract no
XML Instance Representation
<prominence>
<feature> FeatureType </feature> [1]
<blob_count> Count </blob_count> [1]
<blob_separator> xs:string (*length* = 1) </blob_separator> [0..1]
<lat_length> Length </lat_length> [0..1]
<height> Length </height> [0..1]

<max_intensity> ProminenceIntensityType </max_intensity> [0..1]
<min_intensity> ProminenceIntensityType </min_intensity> [0..1]
<mean_intensity> ProminenceIntensityType </mean_intensity> [0..1]
<level_separator> xs:string (*length* = 1) </level_separator> [0..1]
<intensity_level_count> Count </intensity_level_count> [0..1]
<rs> RasterScanType </rs> [1]
</prominence>
Schema Component Representation
<xs:element name="prominence" type="ProminenceType"/>

5.3.17 Element: radio

Name radio
Type RadioType
Nillable no
Abstract no
XML Instance Representation
<radio>
<feature> FeatureType </feature> [1]
<ellipse> EllipseType </ellipse> [0..1]
<id> ID </id> [1]
</radio>
Schema Component Representation
<xs:element name="radio" type="RadioType"/>

5.3.18 Element: sun_spot

Name sun_spot
Type SSType
Nillable no
Abstract no
XML Instance Representation
<sun_spot>
<image> ImageType </image> [1]
<feature> FeatureType </feature> [1]
<diameter> Length </diameter> [1]
<umbra_count> ... </umbra_count> [1]
<umbra_area> Area </umbra_area> [1]
<umbra_total_bz> ... </umbra_total_bz> [1]
<umbra_abs_total_bz> ... </umbra_abs_total_bz> [1]
<umbra_max_bz> ... </umbra_max_bz> [1]
<umbra_min_bz> ... </umbra_min_bz> [1]
<umbra_mean_bz> ... </umbra_mean_bz> [1]
<umbra_max_intensity> IntensityType </umbra_max_intensity> [1]
<umbra_min_intensity> IntensityType </umbra_min_intensity> [1]
<umbra_mean_intensity> IntensityType </umbra_mean_intensity> [1]

<umbra_diameter> Length </umbra_diameter> [1..*]
<id> ID </id> [1]
<rs> RasterScanType </rs> [1]
</sun_spot>
Schema Component Representation
<xs:element name="sun_spot" type="SSType"/>

5.3.19 Element: type_II

Name type_II
Type TypeIIType
Nillable no
Abstract no
XML Instance Representation
<type_II>
<id> ID </id> [1]
<level_of_trust> LevelOfTrustType </level_of_trust> [0..1]
<rs> RasterScanType </rs> [1]
<skeleton> SkeletonType </skeleton> [1]
<time_period> ... </time_period> [1]
<drift> DriftType </drift> [0..1]
</type_II>
Schema Component Representation
<xs:element name="type_II" type="TypeIIType"/>

5.3.20 Element: type_III

Name type_III
Type TypeIIIType
Nillable no
Abstract no
XML Instance Representation
<type_III>
<id> ID </id> [1]
<level_of_trust> LevelOfTrustType </level_of_trust> [0..1]
<skeleton> SkeletonType </skeleton> [1]
<number_of_components> xs:int </number_of_components> [1]
<drift> DriftType </drift> [0..1]
<component> xs:string (*value* comes from list: {'F'|'H'|''|'NULL'|''}) </component> [0..1]
</type_III>
Schema Component Representation
<xs:element name="type_III" type="TypeIIIType"/>

5.4 Global Definitions

5.4.1 Complex Type: ARType

Super-types: None

Sub-types: None

Name ARType

Abstract no

XML Instance Representation

<...>
<image> ImageType </image> [1]
<feature> FeatureType </feature> [1]
<skeleton_centre> Location </skeleton_centre> [1..*]
<neutral_line_length_Mm> xs:float </neutral_line_length_Mm> [1]
<strong_gradient_length> xs:float </strong_gradient_length> [1]
<max_gradient> xs:float </max_gradient> [1]
<mean_gradient> xs:float </mean_gradient> [1]
<median_gradient> xs:float </median_gradient> [1]
<r_schrijver> xs:float </r_schrijver> [0..1]
<wlsg> xs:float </wlsg> [0..1]
<noaa_number> xs:integer </noaa_number> [0..1]
<id> ID </id> [1]
<noaa_solar_region_id> ID </noaa_solar_region_id> [0..1]
</...>

Schema Component Representation

```
<xs:complexType name="ARType">
<xs:sequence>
<xs:element name="image" type="ImageType" maxOccurs="1" minOccurs="1"/>
<xs:element name="feature" type="FeatureType" maxOccurs="1" minOccurs="1"/>
<xs:element name="skeleton_centre" type="Location" maxOccurs="unbounded"
minOccurs="1"/>
<xs:element name="neutral_line_length_Mm" type="xs:float" maxOccurs="1"
minOccurs="1"/>
<xs:element name="strong_gradient_length" type="xs:float" maxOccurs="1"
minOccurs="1"/>
<xs:element name="max_gradient" type="xs:float" maxOccurs="1" minOccurs="1"/>
<xs:element name="mean_gradient" type="xs:float" maxOccurs="1" minOccurs="1"/>
<xs:element name="median_gradient" type="xs:float" maxOccurs="1" minOccurs="1"/>
<xs:element name="r_schrijver" type="xs:float" maxOccurs="1" minOccurs="0"/>
<xs:element name="wlsg" type="xs:float" maxOccurs="1" minOccurs="0"/>
<xs:element name="noaa_number" type="xs:integer" maxOccurs="1" minOccurs="0"/>
<xs:element name="id" type="ID" maxOccurs="1" minOccurs="1"/>
<xs:element name="noaa_solar_region_id" type="ID" maxOccurs="1" minOccurs="0"/>
</xs:sequence>
</xs:complexType>
```

5.4.2 Complex Type: Area

Super-types: None

Sub-types: None

Name Area

Abstract no

XML Instance Representation
<...>
Start Choice [1]
<area_deg_sq> xs:double </area_deg_sq> [1]
<area_Mm_sq> xs:double </area_Mm_sq> [1]
<area_number_pixel> ... </area_number_pixel> [1]
End Choice
</...>
Schema Component Representation
<xs:complexType name="Area">
<xs:choice>
<xs:element name="area_deg_sq" type="xs:double" maxOccurs="1"/>
<xs:element name="area_Mm_sq" type="xs:double" maxOccurs="1"/>
<xs:element name="area_number_pixel" maxOccurs="1" minOccurs="1"/>
</xs:choice>
</xs:complexType>

5.4.3 Complex Type: CHType

Super-types: None

Sub-types: None

Name CHType

Abstract no

XML Instance Representation
<...>
<image> ImageType </image> [1]
<feature> FeatureType </feature> [1]
<image_id> xs:integer </image_id> [1]
<image_group_id> xs:integer </image_group_id> [1]
<threshold> xs:double </threshold> [1]
<size> Location </size> [1..*]
<id> xs:integer </id> [1]
<coronal_hole_partof_group> CHType </coronal_hole_partof_group> [0..*]
</...>
Schema Component Representation
<xs:complexType name="CHType">
<xs:sequence>
<xs:element name="image" type="ImageType" maxOccurs="1" minOccurs="1"/>
<xs:element name="feature" type="FeatureType" maxOccurs="1" minOccurs="1"/>
<xs:element name="image_id" type="xs:integer" maxOccurs="1" minOccurs="1"/>
<xs:element name="image_group_id" type="xs:integer" maxOccurs="1" minOccurs="1"/>

<xs:element name="threshold" type="xs:double" maxOccurs="1" minOccurs="1"/>
<xs:element name="size" type="Location" maxOccurs="unbounded" minOccurs="1"/>
<xs:element name="id" type="xs:integer" maxOccurs="1" minOccurs="1"/>
<xs:element name="coronal_hole_partof_group" type="CHType" maxOccurs="unbounded" minOccurs="0"/>
</xs:sequence>
</xs:complexType>

5.4.4 Complex Type: ChainCodeType

Super-types: None
Sub-types: None
Name ChainCodeType
Abstract no
XML Instance Representation
<...>
<start_pos> Location </start_pos> [1..*]
<cc> xs:string </cc> [1]
<length> xs:integer </length> [1]
</...>
Schema Component Representation
<xs:complexType name="ChainCodeType">
<xs:sequence>
<xs:element name="start_pos" type="Location" maxOccurs="unbounded" minOccurs="1"/>
<xs:element name="cc" type="xs:string" maxOccurs="1" minOccurs="1"/>
<xs:element name="length" type="xs:integer" maxOccurs="1" minOccurs="1"/>
</xs:sequence>
</xs:complexType>

5.4.5 Complex Type: DriftType

Super-types: None
Sub-types: None
Name DriftType
Abstract no
XML Instance Representation
<...>
<drift_rate_start> xs:float </drift_rate_start> [0..1]
<drift_rate_end> xs:float </drift_rate_end> [0..1]
<drift_rate_average> xs:float </drift_rate_average> [0..1]
<fitted_coefficient> xs:float </fitted_coefficient> [0..1]
<fitted_exponent> xs:float </fitted_exponent> [0..1]
</...>
Schema Component Representation
<xs:complexType name="DriftType">
<xs:sequence>

<xs:element name="drift_rate_start" type="xs:float" maxOccurs="1" minOccurs="0"/>
<xs:element name="drift_rate_end" type="xs:float" maxOccurs="1" minOccurs="0"/>
<xs:element name="drift_rate_average" type="xs:float" maxOccurs="1" minOccurs="0"/>
<xs:element name="fitted_coefficient" type="xs:float" maxOccurs="1" minOccurs="0"/>
<xs:element name="fitted_exponent" type="xs:float" maxOccurs="1" minOccurs="0"/>
</xs:sequence>
</xs:complexType>

5.4.6 Complex Type: EllipseType

Super-types: None

Sub-types: None

Name EllipseType

Abstract no

XML Instance Representation
<...>
<angle> xs:float </angle> [1]
<axis1> Length </axis1> [1]
<axis2> Length </axis2> [1]
<centre> Location </centre> [1]
<percent> xs:float </percent> [0..1]
</...>
Schema Component Representation
<xs:complexType name="EllipseType">
<xs:sequence>
<xs:element name="angle" type="xs:float" maxOccurs="1" minOccurs="1"/>
<xs:element name="axis1" type="Length" maxOccurs="1" minOccurs="1"/>
<xs:element name="axis2" type="Length" maxOccurs="1" minOccurs="1"/>
<xs:element name="centre" type="Location" maxOccurs="1" minOccurs="1"/>
<xs:element name="percent" type="xs:float" maxOccurs="1" minOccurs="0"/>
</xs:sequence>
</xs:complexType>

5.4.7 Complex Type: FeatureList

Super-types: None

Sub-types: None

Name FeatureList

Abstract no

XML Instance Representation
<...>
<time_period> ... </time_period> [1]
<list_id> ID </list_id> [1]
<list_name> xs:string </list_name> [1]
<list_description> xs:string </list_description> [1]
<caviats> xs:string </caviats> [0..*]

<list_type> HFCListType </list_type> [1]
<instsrument> ns1:instrument </instsrument> [1..*]
<encoding_method> EMType </encoding_method> [1]
</...>
Schema Component Representation
<xs:complexType name="FeatureList">
<xs:sequence>
<xs:element ref="time_period" maxOccurs="1" minOccurs="1"/>
<xs:element name="list_id" type="ID" maxOccurs="1" minOccurs="1"/>
<xs:element name="list_name" type="xs:string" maxOccurs="1" minOccurs="1"/>
<xs:element name="list_description" type="xs:string" maxOccurs="1" minOccurs="1"/>
<xs:element name="caviats" type="xs:string" maxOccurs="unbounded" minOccurs="0"/>
<xs:element name="list_type" type="HFCListType" maxOccurs="1" minOccurs="1"/>
<xs:element name="instsrument" type="ns1:instrument" maxOccurs="unbounded"
minOccurs="1"/>
<xs:element name="encoding_method" type="EMType" maxOccurs="1" minOccurs="1"/>
</xs:sequence>
</xs:complexType>

5.4.8 Complex Type: FeatureRecognisionCodeType

Super-types: None

Sub-types: None

Name FeatureRecognisionCodeType

Abstract no

XML Instance Representation
<...>
<feature_name> xs:string </feature_name> [0..1]
<code_id> ID </code_id> [1]
<institute> xs:string </institute> [1]
<code_name> xs:string </code_name> [1]
<version> xs:string </version> [1]
<encoding> xs:string </encoding> [0..1]
<person> xs:string </person> [1]
<email> Email </email> [1]
<reference> xs:string </reference> [0..*]
</...>
Schema Component Representation
<xs:complexType name="FeatureRecognisionCodeType">
<xs:sequence>
<xs:element name="feature_name" type="xs:string" maxOccurs="1" minOccurs="0"/>
<xs:element name="code_id" type="ID" maxOccurs="1" minOccurs="1"/>
<xs:element name="institute" type="xs:string" maxOccurs="1" minOccurs="1"/>
<xs:element name="code_name" type="xs:string" maxOccurs="1" minOccurs="1"/>
<xs:element name="version" type="xs:string" maxOccurs="1" minOccurs="1"/>
<xs:element name="encoding" type="xs:string" maxOccurs="1" minOccurs="0"/>
<xs:element name="person" type="xs:string" maxOccurs="1" minOccurs="1"/>
<xs:element name="email" type="Email" maxOccurs="1" minOccurs="1"/>

<xs:element name="reference" type="xs:string" maxOccurs="unbounded" minOccurs="0"/>
</xs:sequence>
</xs:complexType>

5.4.9 Complex Type: FeatureType

Super-types: None

Sub-types: None

Name FeatureType

Abstract no

XML Instance Representation

<...>

 BoundingRectangle </br> [1..*]
<centre> Location </centre> [0..*]
<area> Area </area> [1]
<max_bz> IntensityType </max_bz> [0..1]
<min_bz> IntensityType </min_bz> [0..1]
<mean_bz> IntensityType </mean_bz> [0..1]
<total_bz> IntensityType </total_bz> [0..1]
<abs_total_bz> IntensityType </abs_total_bz> [0..1]
<skew_bz> IntensityType </skew_bz> [0..1]
<mean_intensitiy_2quiet_sun> xs:double </mean_intensitiy_2quiet_sun> [0..1]
<chain_code> ChainCodeType </chain_code> [1]
<snapshot> URL </snapshot> [1]
<max_intensity> PhotoIntensityType </max_intensity> [1]
<min_intensity> PhotoIntensityType </min_intensity> [0..1]
<mean_intensity> PhotoIntensityType </mean_intensity> [1]
<output_file_name> xs:string </output_file_name> [0..1]
<source_file_name> xs:string </source_file_name> [0..1]
<original_file_name> xs:string </original_file_name> [0..1]
<run_time> Time </run_time> [1]
<quiet_sun_intensity> xs:int </quiet_sun_intensity> [0..1]
</...>

Schema Component Representation

<xs:complexType name="FeatureType">
<xs:sequence>
<xs:element name="br" type="BoundingRectangle" maxOccurs="unbounded" minOccurs="1"/>
<xs:element name="centre" type="Location" maxOccurs="unbounded" minOccurs="0"/>
<xs:element name="area" type="Area" maxOccurs="1" minOccurs="1"/>
<xs:element name="max_bz" type="IntensityType" maxOccurs="1" minOccurs="0"/>
<xs:element name="min_bz" type="IntensityType" maxOccurs="1" minOccurs="0"/>
<xs:element name="mean_bz" type="IntensityType" maxOccurs="1" minOccurs="0"/>
<xs:element name="total_bz" type="IntensityType" maxOccurs="1" minOccurs="0"/>
<xs:element name="abs_total_bz" type="IntensityType" maxOccurs="1" minOccurs="0"/>
<xs:element name="skew_bz" type="IntensityType" maxOccurs="1" minOccurs="0"/>
<xs:element name="mean_intensitiy_2quiet_sun" type="xs:double" maxOccurs="1" minOccurs="0"/>

<xs:element name="chain_code" type="ChainCodeType" maxOccurs="1" minOccurs="1"/>
<xs:element name="snapshot" type="URL"/>
<xs:element name="max_intensity" type="PhotoIntensityType" maxOccurs="1" minOccurs="1"/>
<xs:element name="min_intensity" type="PhotoIntensityType" maxOccurs="1" minOccurs="0"/>
<xs:element name="mean_intensity" type="PhotoIntensityType" maxOccurs="1" minOccurs="1"/>
<xs:element name="output_file_name" type="xs:string" maxOccurs="1" minOccurs="0"/>
<xs:element name="source_file_name" type="xs:string" maxOccurs="1" minOccurs="0"/>
<xs:element name="original_file_name" type="xs:string" maxOccurs="1" minOccurs="0"/>
<xs:element name="run_time" type="Time" maxOccurs="1" minOccurs="1"/>
<xs:element name="quiet_sun_intensity" type="xs:int" maxOccurs="1" minOccurs="0"/>
</xs:sequence>
</xs:complexType>

5.4.10 Complex Type: FilamentType

Super-types: None

Sub-types: None

Name FilamentType

Abstract no

XML Instance Representation
<...>
<image> ImageType </image> [1]
<feature> FeatureType </feature> [1]
<skeleton> SkeletonType </skeleton> [1]
<elongation> xs:float </elongation> [1]
<orientation> ... </orientation> [1]
<id> ID </id> [1]
</...>
Schema Component Representation
<xs:complexType name="FilamentType">
<xs:sequence>
<xs:element name="image" type="ImageType" maxOccurs="1" minOccurs="1"/>
<xs:element name="feature" type="FeatureType" maxOccurs="1" minOccurs="1"/>
<xs:element name="skeleton" type="SkeletonType" maxOccurs="1" minOccurs="1"/>
<xs:element name="elongation" type="xs:float" maxOccurs="1" minOccurs="1"/>
<xs:element name="orientation" maxOccurs="1" minOccurs="1"/>
<xs:element name="id" type="ID" maxOccurs="1" minOccurs="1"/>
</xs:sequence>
</xs:complexType>

5.4.11 Complex Type: HFCListType

Super-types: None

Sub-types: None

Name HFCListType

Abstract no

XML Instance Representation

<...>
Start Choice [1]
<active_region> ARType </active_region> [1..*]
<coronal_hole> CHType </coronal_hole> [1..*]
<filament> FilamentType </filament> [1..*]
<sun_spot> SSType </sun_spot> [1..*]
<prominence> ProminenceType </prominence> [1..*]
<radio> RadioType </radio> [1..*]
End Choice
</...>

Schema Component Representation

```
<xs:complexType name="HFCListType">
<xs:choice maxOccurs="1" minOccurs="1">
<xs:element name="active_region" type="ARType" maxOccurs="unbounded"/>
<xs:element name="coronal_hole" type="CHType" maxOccurs="unbounded"/>
<xs:element name="filament" type="FilamentType" maxOccurs="unbounded"/>
<xs:element name="sun_spot" type="SSType" maxOccurs="unbounded"/>
<xs:element name="prominence" type="ProminenceType" maxOccurs="unbounded"/>
<xs:element name="radio" type="RadioType" maxOccurs="unbounded"/>
</xs:choice>
</xs:complexType>
```

5.4.12 Complex Type: ImageType

Super-types: None

Sub-types: None

Name ImageType

Abstract no

XML Instance Representation

<...>
<time_obs> Time </time_obs> [1]
<time_prev_obs> Time </time_prev_obs> [0..1]
<rot_carr> Location </rot_carr> [1]
<spacial_scale> SpatialScale </spacial_scale> [1]
<bitpix> xs:integer (*value* comes from list: {'8'|'16'|'32'|'-32'|'-64'}) </bitpix> [1]
<bscale> xs:integer </bscale> [1]
<bzero> xs:integer </bzero> [1]
<naxis_x> xs:integer </naxis_x> [1]
<naxis_y> xs:integer </naxis_y> [1]
<centre_sun> Location </centre_sun> [1]
<radius_sun_pix> xs:double </radius_sun_pix> [1]
<org_image> URL </org_image> [0..1]
<julian_date_obs> JulianDate </julian_date_obs> [0..1]

<exposure_time_s> xs:float </exposure_time_s> [0..1]
<bscale> xs:double </bscale> [0..1]
<bzero> xs:double </bzero> [0..1]
<quality> xs:string </quality> [0..1]
<filename> xs:string </filename> [0..1]
<comment> xs:string </comment> [0..1]
</...>
Schema Component Representation

```
<xs:complexType name="ImageType">
<xs:sequence>
<xs:element name="time_obs" type="Time" maxOccurs="1" minOccurs="1"/>
<xs:element name="time_prev_obs" type="Time" maxOccurs="1" minOccurs="0"/>
<xs:element name="rot_carr" type="Location" maxOccurs="1" minOccurs="1"/>
<xs:element name="spacial_scale" type="SpatialScale" maxOccurs="1" minOccurs="1"/>
<xs:element name="bitpix" maxOccurs="1" minOccurs="1">
<xs:simpleType>
<xs:restriction base="xs:integer">
<xs:enumeration value="8"/>
<xs:enumeration value="16"/>
<xs:enumeration value="32"/>
<xs:enumeration value="-32"/>
<xs:enumeration value="-64"/>
</xs:restriction>
</xs:simpleType>
</xs:element>
<xs:element name="bscale" type="xs:integer" maxOccurs="1" minOccurs="1"/>
<xs:element name="bzero" type="xs:integer" maxOccurs="1" minOccurs="1"/>
<xs:element name="naxis_x" type="xs:integer" maxOccurs="1" minOccurs="1"/>
<xs:element name="naxis_y" type="xs:integer" maxOccurs="1" minOccurs="1"/>
<xs:element name="centre_sun" type="Location" maxOccurs="1" minOccurs="1"/>
<xs:element name="radius_sun_pix" type="xs:double" maxOccurs="1" minOccurs="1"/>
<xs:element name="org_image" type="URL" maxOccurs="1" minOccurs="0"/>
<xs:element name="julian_date_obs" type="JulianDate" maxOccurs="1" minOccurs="0"/>
<xs:element name="exposure_time_s" type="xs:float" maxOccurs="1" minOccurs="0"/>
<xs:element name="bscale" type="xs:double" maxOccurs="1" minOccurs="0"/>
<xs:element name="bzero" type="xs:double" maxOccurs="1" minOccurs="0"/>
<xs:element name="quality" type="xs:string" maxOccurs="1" minOccurs="0"/>
<xs:element name="filename" type="xs:string" maxOccurs="1" minOccurs="0"/>
<xs:element name="comment" type="xs:string" maxOccurs="1" minOccurs="0"/>
</xs:sequence>
</xs:complexType>
```

5.4.13 Complex Type: IntensityType

Super-types: None
Sub-types: None
Name IntensityType
Abstract no

XML Instance Representation
<...>
Start Choice [1]
<bz_magnetic_field_gauss> xs:double </bz_magnetic_field_gauss> [1]
End Choice
</...>
Schema Component Representation
<xs:complexType name="IntensityType">
<xs:choice>
<xs:element name="bz_magnetic_field_gauss" type="xs:double"/>
</xs:choice>
</xs:complexType>

5.4.14 Complex Type: Length

Super-types: None
Sub-types: None
Name Length
Abstract no
XML Instance Representation
<...>
Start Choice [1]
<degrees> xs:float </degrees> [1]
<mega_meter> xs:float </mega_meter> [1]
<arcsec> xs:float </arcsec> [1]
<km> xs:float </km> [1]
<pix> xs:int </pix> [1]
End Choice
</...>
Schema Component Representation
<xs:complexType name="Length">
<xs:choice maxOccurs="1" minOccurs="1">
<xs:element name="degrees" type="xs:float"/>
<xs:element name="mega_meter" type="xs:float"/>
<xs:element name="arcsec" type="xs:float"/>
<xs:element name="km" type="xs:float"/>
<xs:element name="pix" type="xs:int"/>
</xs:choice>
</xs:complexType>

5.4.15 Complex Type: ObservationType

Super-types: None
Sub-types: None
Name ObservationType
Abstract no

XML Instance Representation
<...>
<image> ImageType </image> [1]
<carrington_rotation> CarringtonType </carrington_rotation> [1]
<time_period> TimePeriod </time_period> [1]
<exposure_time_s> xs:float </exposure_time_s> [0..1]
<file_format> xs:string </file_format> [0..1]
<original_file_name> xs:string </original_file_name> [0..1]
<id> ID </id> [1]
<url_orig_file> URL </url_orig_file> [0..1]
<quick_look_file_name> xs:string </quick_look_file_name> [0..1]
<url_quick_look_file> URL </url_quick_look_file> [0..1]
<quality> ... </quality> [0..1]
<local_file_path> xs:string </local_file_path> [0..1]
</...>
Schema Component Representation
<xs:complexType name="ObservationType">
<xs:sequence>
<xs:element name="image" type="ImageType"/>
<xs:element name="carrington_rotation" type="CarringtonType"/>
<xs:element name="time_period" type="TimePeriod" maxOccurs="1" minOccurs="1"/>
<xs:element name="exposure_time_s" type="xs:float" maxOccurs="1" minOccurs="0"/>
<xs:element name="file_format" type="xs:string" maxOccurs="1" minOccurs="0"/>
<xs:element name="original_file_name" type="xs:string" maxOccurs="1" minOccurs="0"/>
<xs:element name="id" type="ID" maxOccurs="1" minOccurs="1"/>
<xs:element name="url_orig_file" type="URL" maxOccurs="1" minOccurs="0"/>
<xs:element name="quick_look_file_name" type="xs:string" maxOccurs="1"
minOccurs="0"/>
<xs:element name="url_quick_look_file" type="URL" maxOccurs="1" minOccurs="0"/>
<xs:element name="quality" maxOccurs="1" minOccurs="0"/>
<xs:element name="local_file_path" type="xs:string" maxOccurs="1" minOccurs="0"/>
</xs:sequence>
</xs:complexType>

5.4.16 Complex Type: ObservatoryType

Super-types: None

Sub-types: None

Name ObservatoryType

Abstract no

XML Instance Representation
<...>
<observatory> xs:string </observatory> [1]
<instrument> xs:string </instrument> [1]
<telescope> xs:string </telescope> [1]
<observatory_instrument_id> ns1:instrument </observatory_instrument_id> [1]
<id> ID </id> [1]

<observatory_type> xs:string (*value* comes from list: {'Remote-sensing'|'in situ'})
</observatory_type> [0..1]
<unit> xs:string (*value* comes from list: {'Gauss'|'Counts'|'dB above background'|'SFU'})
</unit> [0..1]
<spectral_name> xs:string (*value* comes from list: {'Line_of_sight magnetic field'|'Extreme ultraviolet'|'Radio'|'visible'}) </spectral_name> [0..1]
<wave_unit> xs:string (*value* comes from list: {'nm'|'MHz'}) </wave_unit> [1]
<wave_name> xs:string </wave_name> [0..1]
<wave_min> xs:float </wave_min> [1]
<wave_max> xs:float </wave_max> [1]
</...>
Schema Component Representation

```
<xs:complexType name="ObservatoryType">
<xs:sequence>
<xs:element name="observatory" type="xs:string" maxOccurs="1" minOccurs="1"/>
<xs:element name="instrument" type="xs:string" maxOccurs="1" minOccurs="1"/>
<xs:element name="telescope" type="xs:string" maxOccurs="1" minOccurs="1"/>
<xs:element name="observatory_instrument_id" type="ns1:instrument" maxOccurs="1" minOccurs="1"/>
<xs:element name="id" type="ID" maxOccurs="1" minOccurs="1"/>
<xs:element name="observatory_type" maxOccurs="1" minOccurs="0">
<xs:simpleType>
<xs:restriction base="xs:string">
<xs:enumeration value="Remote-sensing"/>
<xs:enumeration value="in situ"/>
</xs:restriction>
</xs:simpleType>
</xs:element>
<xs:element name="unit" maxOccurs="1" minOccurs="0">
<xs:simpleType>
<xs:restriction base="xs:string">
<xs:enumeration value="Gauss"/>
<xs:enumeration value="Counts"/>
<xs:enumeration value="dB above background"/>
<xs:enumeration value="SFU"/>
</xs:restriction>
</xs:simpleType>
</xs:element>
<xs:element name="spectral_name" maxOccurs="1" minOccurs="0">
<xs:simpleType>
<xs:restriction base="xs:string">
<xs:enumeration value="Line_of_sight magnetic field"/>
<xs:enumeration value="Extreme ultraviolet"/>
<xs:enumeration value="Radio"/>
<xs:enumeration value="visible"/>
</xs:restriction>
</xs:simpleType>
</xs:element>
<xs:element name="wave_unit" maxOccurs="1" minOccurs="1">
<xs:simpleType>
```

<xs:restriction base="xs:string">
<xs:enumeration value="nm"/>
<xs:enumeration value="MHz"/>
</xs:restriction>
</xs:simpleType>
</xs:element>
<xs:element name="wave_name" type="xs:string" maxOccurs="1" minOccurs="0"/>
<xs:element name="wave_min" type="xs:float" maxOccurs="1" minOccurs="1"/>
<xs:element name="wave_max" type="xs:float" maxOccurs="1" minOccurs="1"/>
</xs:sequence>
</xs:complexType>

5.4.17 Complex Type: PhotoIntensityType

Super-types: None

Sub-types: None

Name PhotoIntensityType

Abstract no

XML Instance Representation
<...>
Start Choice [1]
<w_per_m2_per_hz> xs:double </w_per_m2_per_hz> [1]
<jansky> xs:double </jansky> [1]
<solar_flux_units> xs:double </solar_flux_units> [1]
End Choice
</...>
Schema Component Representation
<xs:complexType name="PhotoIntensityType">
<xs:choice maxOccurs="1" minOccurs="1">
<xs:element name="w_per_m2_per_hz" type="xs:double"/>
<xs:element name="jansky" type="xs:double"/>
<xs:element name="solar_flux_units" type="xs:double"/>
</xs:choice>
</xs:complexType>

5.4.18 Complex Type: PreprocessingOutputType

Super-types: None

Sub-types: None

Name PreprocessingOutputType

Abstract no

XML Instance Representation
<...>
<background_cleaning> xs:boolean </background_cleaning> [1]
<algebraic_error_pix> xs:int </algebraic_error_pix> [0..1]
<bits_per_pixel> xs:int </bits_per_pixel> [1]

<division_to_normalise> xs:boolean </division_to_normalise> [1]
<ellipse_fitting> xs:boolean </ellipse_fitting> [0..1]
<ellipse> EllipseType </ellipse> [0..1]
<id> ID </id> [1]
<normalizing_parameter> xs:float </normalizing_parameter> [0..1]
<limb_darkening_removal> xs:boolean </limb_darkening_removal> [0..1]
<line_cleaning> xs:boolean </line_cleaning> [0..1]
<line_cleaning_direction_deg> xs:float </line_cleaning_direction_deg> [0..1]
<image> ImageType </image> [1]
<standardisation> xs:boolean </standardisation> [0..1]
<standard_deviation> xs:float </standard_deviation> [0..1]
<geometric_standard_deviation> xs:float </geometric_standard_deviation> [0..1]
</...>
Schema Component Representation

```
<xs:complexType name="PreprocessingOutputType">
<xs:sequence>
<xs:element name="background_cleaning" type="xs:boolean" maxOccurs="1"
minOccurs="1"/>
<xs:element name="algebraic_error_pix" type="xs:int" maxOccurs="1" minOccurs="0"/>
<xs:element name="bits_per_pixel" type="xs:int" maxOccurs="1" minOccurs="1"/>
<xs:element name="division_to_normalise" type="xs:boolean" maxOccurs="1"
minOccurs="1"/>
<xs:element name="ellipse_fitting" type="xs:boolean" maxOccurs="1" minOccurs="0"/>
<xs:element name="ellipse" type="EllipseType" maxOccurs="1" minOccurs="0"/>
<xs:element name="id" type="ID" maxOccurs="1" minOccurs="1"/>
<xs:element name="normalizing_parameter" type="xs:float" maxOccurs="1"
minOccurs="0"/>
<xs:element name="limb_darkening_removal" type="xs:boolean" maxOccurs="1"
minOccurs="0"/>
<xs:element name="line_cleaning" type="xs:boolean" maxOccurs="1" minOccurs="0"/>
<xs:element name="line_cleaning_direction_deg" type="xs:float" maxOccurs="1"
minOccurs="0"/>
<xs:element name="image" type="ImageType" maxOccurs="1" minOccurs="1"/>
<xs:element name="standardisation" type="xs:boolean" maxOccurs="1" minOccurs="0"/>
<xs:element name="standard_deviation" type="xs:float" maxOccurs="1" minOccurs="0"/>
<xs:element name="geometric_standard_deviation" type="xs:float" maxOccurs="1"
minOccurs="0"/>
</xs:sequence>
</xs:complexType>
```

5.4.19 Complex Type: ProminenceType

Super-types: None

Sub-types: None

Name ProminenceType

Abstract no

XML Instance Representation

<...>

<feature> FeatureType </feature> [1]
<blob_count> Count </blob_count> [1]
<blob_separator> xs:string (*length* = 1) </blob_separator> [0..1]
<lat_length> Length </lat_length> [0..1]
<height> Length </height> [0..1]
<max_intensity> ProminenceIntensityType </max_intensity> [0..1]
<min_intensity> ProminenceIntensityType </min_intensity> [0..1]
<mean_intensity> ProminenceIntensityType </mean_intensity> [0..1]
<level_separator> xs:string (*length* = 1) </level_separator> [0..1]
<intensity_level_count> Count </intensity_level_count> [0..1]
<rs> RasterScanType </rs> [1]
</...>
Schema Component Representation

```
<xs:complexType name="ProminenceType">
<xs:sequence>
<xs:element name="feature" type="FeatureType" maxOccurs="1" minOccurs="1"/>
<xs:element name="blob_count" type="Count" maxOccurs="1" minOccurs="1"/>
<xs:element name="blob_separator" maxOccurs="1" minOccurs="0">
<xs:simpleType>
<xs:restriction base="xs:string">
<xs:length value="1"/>
</xs:restriction>
</xs:simpleType>
</xs:element>
<xs:element name="lat_length" type="Length" maxOccurs="1" minOccurs="0"/>
<xs:element name="height" type="Length" maxOccurs="1" minOccurs="0"/>
<xs:element name="max_intensity" type="ProminenceIntensityType" maxOccurs="1"
minOccurs="0"/>
<xs:element name="min_intensity" type="ProminenceIntensityType" maxOccurs="1"
minOccurs="0"/>
<xs:element name="mean_intensity" type="ProminenceIntensityType" maxOccurs="1"
minOccurs="0"/>
<xs:element name="level_separator" maxOccurs="1" minOccurs="0">
<xs:simpleType>
<xs:restriction base="xs:string">
<xs:length value="1"/>
</xs:restriction>
</xs:simpleType>
</xs:element>
<xs:element name="intensity_level_count" type="Count" maxOccurs="1" minOccurs="0"/>
<xs:element name="rs" type="RasterScanType" maxOccurs="1" minOccurs="1"/>
</xs:sequence>
</xs:complexType>
```

5.4.20 Complex Type: RadioType

Super-types: None
Sub-types: None

Name RadioType
Abstract no
XML Instance Representation
<...>
<feature> FeatureType </feature> [1]
<ellipse> EllipseType </ellipse> [0..1]
<id> ID </id> [1]
</...>
Schema Component Representation
<xs:complexType name="RadioType">
<xs:sequence>
<xs:element name="feature" type="FeatureType" maxOccurs="1" minOccurs="1"/>
<xs:element name="ellipse" type="EllipseType" maxOccurs="1" minOccurs="0"/>
<xs:element name="id" type="ID" maxOccurs="1" minOccurs="1"/>
</xs:sequence>
</xs:complexType>

5.4.21 Complex Type: RasterScanType

Super-types: None
Sub-types: None
Name RasterScanType
Abstract no
XML Instance Representation
<...>
<raster_scan> xs:string </raster_scan> [1]
<raster_scan_length> Count </raster_scan_length> [1]
</...>
Schema Component Representation
<xs:complexType name="RasterScanType">
<xs:sequence>
<xs:element name="raster_scan" type="xs:string" maxOccurs="1" minOccurs="1"/>
<xs:element name="raster_scan_length" type="Count" maxOccurs="1" minOccurs="1"/>
</xs:sequence>
</xs:complexType>

5.4.22 Complex Type: SSType

Super-types: None
Sub-types: None
Name SSType
Abstract no
XML Instance Representation
<...>
<image> ImageType </image> [1]

<feature> FeatureType </feature> [1]
<diameter> Length </diameter> [1]
<umbra_count> ... </umbra_count> [1]
<umbra_area> Area </umbra_area> [1]
<umbra_total_bz> ... </umbra_total_bz> [1]
<umbra_abs_total_bz> ... </umbra_abs_total_bz> [1]
<umbra_max_bz> ... </umbra_max_bz> [1]
<umbra_min_bz> ... </umbra_min_bz> [1]
<umbra_mean_bz> ... </umbra_mean_bz> [1]
<umbra_max_intensity> IntensityType </umbra_max_intensity> [1]
<umbra_min_intensity> IntensityType </umbra_min_intensity> [1]
<umbra_mean_intensity> IntensityType </umbra_mean_intensity> [1]
<umbra_diameter> Length </umbra_diameter> [1..*]
<id> ID </id> [1]
<rs> RasterScanType </rs> [1]
</...>
Schema Component Representation

```
<xs:complexType name="SSType">
<xs:sequence>
<xs:element name="image" type="ImageType" maxOccurs="1" minOccurs="1"/>
<xs:element name="feature" type="FeatureType" maxOccurs="1" minOccurs="1"/>
<xs:element name="diameter" type="Length" maxOccurs="1" minOccurs="1"/>
<xs:element name="umbra_count" maxOccurs="1" minOccurs="1"/>
<xs:element name="umbra_area" type="Area" maxOccurs="1" minOccurs="1"/>
<xs:element name="umbra_total_bz" maxOccurs="1" minOccurs="1"/>
<xs:element name="umbra_abs_total_bz" maxOccurs="1" minOccurs="1"/>
<xs:element name="umbra_max_bz" maxOccurs="1" minOccurs="1"/>
<xs:element name="umbra_min_bz" maxOccurs="1" minOccurs="1"/>
<xs:element name="umbra_mean_bz" maxOccurs="1" minOccurs="1"/>
<xs:element name="umbra_max_intensity" type="IntensityType" maxOccurs="1"
minOccurs="1"/>
<xs:element name="umbra_min_intensity" type="IntensityType" maxOccurs="1"
minOccurs="1"/>
<xs:element name="umbra_mean_intensity" type="IntensityType" maxOccurs="1"
minOccurs="1"/>
<xs:element name="umbra_diameter" type="Length" maxOccurs="unbounded"
minOccurs="1"/>
<xs:element name="id" type="ID" maxOccurs="1" minOccurs="1"/>
<xs:element name="rs" type="RasterScanType" maxOccurs="1" minOccurs="1"/>
</xs:sequence>
</xs:complexType>
```

5.4.23 Complex Type: SkeletonType

Super-types: None

Sub-types: None

Name SkeletonType

Abstract no

XML Instance Representation
<...>
<centre> Location </centre> [0..*]
<length_deg> xs:float </length_deg> [0..1]
<curvation> xs:float </curvation> [0..1]
<chain_code> ChainCodeType </chain_code> [1]
</...>
Schema Component Representation
<xs:complexType name="SkeletonType">
<xs:sequence>
<xs:element name="centre" type="Location" maxOccurs="unbounded" minOccurs="0"/>
<xs:element name="length_deg" type="xs:float" maxOccurs="1" minOccurs="0"/>
<xs:element name="curvation" type="xs:float" maxOccurs="1" minOccurs="0"/>
<xs:element name="chain_code" type="ChainCodeType" maxOccurs="1" minOccurs="1"/>
</xs:sequence>
</xs:complexType>

5.4.24 Complex Type: SpatialScale

Super-types: None
Sub-types: None
Name SpatialScale
Abstract no
XML Instance Representation
<...>
Start Choice [1]
<spatial_scale_x_arcsec> xs:double </spatial_scale_x_arcsec> [1]
<spatial_scale_x_time> ... </spatial_scale_x_time> [1]
End Choice
Start Choice [1]
<spatial_scale_y_arcsec> xs:double </spatial_scale_y_arcsec> [1]
<spatial_scale_y_measurement> ... </spatial_scale_y_measurement> [1]
End Choice
</...>
Schema Component Representation
<xs:complexType name="SpatialScale">
<xs:sequence maxOccurs="1" minOccurs="1">
<xs:choice maxOccurs="1" minOccurs="1">
<xs:element name="spatial_scale_x_arcsec" type="xs:double" maxOccurs="1"
minOccurs="1"/>
<xs:element name="spatial_scale_x_time" maxOccurs="1"/>
</xs:choice>
<xs:choice maxOccurs="1" minOccurs="1">
<xs:element name="spatial_scale_y_arcsec" type="xs:double" maxOccurs="1"
minOccurs="1"/>
<xs:element name="spatial_scale_y_measurement"/>
</xs:choice>
</xs:sequence>

</xs:complexType>

5.4.25 Complex Type: TrackingType

Super-types: None

Sub-types: None

Name TrackingType

Abstract no

XML Instance Representation

<...>
<id> ID </id> [1]
<level_of_trust> LevelOfTrustType </level_of_trust> [0..1]
<behaviour_code> xs:int </behaviour_code> [1]
<tracking_id> TrackingIDType </tracking_id> [1]
<previous_tracking_id> TrackingIDType </previous_tracking_id> [0..1]
<feature> FeatureType </feature> [1]
</...>

Schema Component Representation

```
<xs:complexType name="TrackingType">
<xs:sequence>
<xs:element name="id" type="ID" maxOccurs="1" minOccurs="1"/>
<xs:element name="level_of_trust" type="LevelOfTrustType" maxOccurs="1"
minOccurs="0"/>
<xs:element name="behaviour_code" type="xs:int" maxOccurs="1" minOccurs="1"/>
<xs:element name="tracking_id" type="TrackingIDType" maxOccurs="1"
minOccurs="1"/>
<xs:element name="previous_tracking_id" type="TrackingIDType" maxOccurs="1"
minOccurs="0"/>
<xs:element name="feature" type="FeatureType" maxOccurs="1" minOccurs="1"/>
</xs:sequence>
</xs:complexType>
```

5.4.26 Complex Type: TypeIIIType

Super-types: None

Sub-types: None

Name TypeIIIType

Abstract no

XML Instance Representation

<...>
<id> ID </id> [1]
<level_of_trust> LevelOfTrustType </level_of_trust> [0..1]
<skeleton> SkeletonType </skeleton> [1]
<number_of_components> xs:int </number_of_components> [1]
<drift> DriftType </drift> [0..1]
<component> xs:string (*value* comes from list: {'F'|'H'|''|'NULL'|''}) </component> [0..1]

</...>
Schema Component Representation
<xs:complexType name="TypeIIIType">
<xs:sequence>
<xs:element name="id" type="ID" maxOccurs="1" minOccurs="1"/>
<xs:element name="level_of_trust" type="LevelOfTrustType" maxOccurs="1"
minOccurs="0"/>
<xs:element name="skeleton" type="SkeletonType" maxOccurs="1" minOccurs="1"/>
<xs:element name="number_of_components" type="xs:int" maxOccurs="1"
minOccurs="1"/>
<xs:element name="drift" type="DriftType" maxOccurs="1" minOccurs="0"/>
<xs:element name="component" maxOccurs="1" minOccurs="0">
<xs:simpleType>
<xs:restriction base="xs:string">
<xs:enumeration value="F"/>
<xs:enumeration value="H"/>
<xs:enumeration/>
<xs:enumeration value="NULL"/>
<xs:enumeration/>
</xs:restriction>
</xs:simpleType>
</xs:element>
</xs:sequence>
</xs:complexType>

5.4.27 Complex Type: TypeIIType

Super-types: None
Sub-types: None
Name TypeIIType
Abstract no
XML Instance Representation
<...>
<id> ID </id> [1]
<level_of_trust> LevelOfTrustType </level_of_trust> [0..1]
<rs> RasterScanType </rs> [1]
<skeleton> SkeletonType </skeleton> [1]
<time_period> ... </time_period> [1]
<drift> DriftType </drift> [0..1]
</...>
Schema Component Representation
<xs:complexType name="TypeIIType">
<xs:sequence>
<xs:element name="id" type="ID" maxOccurs="1" minOccurs="1"/>
<xs:element name="level_of_trust" type="LevelOfTrustType" maxOccurs="1"
minOccurs="0"/>
<xs:element name="rs" type="RasterScanType" maxOccurs="1" minOccurs="1"/>
<xs:element name="skeleton" type="SkeletonType" maxOccurs="1" minOccurs="1"/>

<xs:element ref="time_period" maxOccurs="1" minOccurs="1"/>
<xs:element name="drift" type="DriftType" maxOccurs="1" minOccurs="0"/>
</xs:sequence>
</xs:complexType>

5.4.28 Simple Type: EMType

Super-types: xs:string < **EMType** (by restriction)

Sub-types: None

Name EMType

Content

- Base XSD Type: string
- *value* comes from list: {'raster'|'chain code'|'none'}

Schema Component Representation
<xs:simpleType name="EMType">
<xs:restriction base="xs:string">
<xs:enumeration value="raster"/>
<xs:enumeration value="chain code"/>
<xs:enumeration value="none"/>
</xs:restriction>
</xs:simpleType>

5.4.29 Simple Type: LevelOfTrustType

Super-types: xs:int < **LevelOfTrustType** (by restriction)

Sub-types: None

Name LevelOfTrustType

Content

- Base XSD Type: int

Schema Component Representation
<xs:simpleType name="LevelOfTrustType">
<xs:restriction base="xs:int"/>
</xs:simpleType>

5.4.30 Simple Type: ProminenceIntensityType

Super-types: xs:string < **ProminenceIntensityType** (by restriction)

Sub-types: None

Name ProminenceIntensityType

Content

- Base XSD Type: string

- *pattern* = ([0-9])+([A-Z](0-9)+)*

Schema Component Representation
<xs:simpleType name="ProminenceIntensityType">
<xs:restriction base="xs:string">
<xs:pattern value="([0-9])+([A-Z](0-9)+)*"/>
</xs:restriction>
</xs:simpleType>

5.4.31 Simple Type: TrackingIDType

Super-types: xs:int < **TrackingIDType** (by restriction)

Sub-types: None

Name TrackingIDType

Content
- Base XSD Type: int

Schema Component Representation
<xs:simpleType name="TrackingIDType">
<xs:restriction base="xs:int"/>
</xs:simpleType>

---

6 ICS

6.1 Table of Contents

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  - Complex Type: **ObsType**
  - Complex Type: **Observatory**
  - Complex Type: **observatory_location**
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  - Simple Type: **ObsLocation**
  - Simple Type: **ObservableEntity2**
  - Simple Type: **ObservationEntity**
  - Simple Type: **ObservingDomain1**
  - Simple Type: **ObservingDomain2**
  - Simple Type: **SensingType**
  - Simple Type: **observatory_status**

6.2 Schema Document Properties

Target Namespace None

Element and Attribute Namespaces	• Global element and attribute declarations belong to this schema's target namespace. • By default, local element declarations belong to this schema's target namespace. • By default, local attribute declarations have no namespace.
Schema Composition	• This schema imports schema(s) from the following namespace(s): o *http://helio-vo.eu/xml/Instruments/v0.1* (at http://www.helio-vo.eu/services/xml/instruments.xsd) • This schema includes components from the following schema document(s): o helio_data_model-generalTypes.xsd

6.2.1 Declared Namespaces

Prefix	Namespace
xml	http://www.w3.org/XML/1998/namespace
xs	http://www.w3.org/2001/XMLSchema
ns1	http://helio-vo.eu/xml/Instruments/v0.1

Schema Component Representation
<xs:schema attributeFormDefault="unqualified" elementFormDefault="qualified">
<xs:import namespace="http://helio-vo.eu/xml/Instruments/v0.1"
schemaLocation="http://www.helio-vo.eu/services/xml/instruments.xsd"/>
<xs:include schemaLocation="helio_data_model-generalTypes.xsd"/>
...
</xs:schema>

6.3 Global Declarations

6.3.1 Element: instr

Name	instr
Type	Instrument
Nillable	no
Abstract	no

Documentation attributes connected with instruments
XML Instance Representation
<instr>
<observatory_instrument_id> ns1:instrument </observatory_instrument_id> [1]

<instrument_name> ... </instrument_name> [1]
<observatory_name> ... </observatory_name> [1]
<description> xs:string </description> [0..1]
<observable_entity> ObservationEntity </observable_entity> [0..1]
<observable_entity_specification> ObservableEntity2 </observable_entity_specification> [0..1]
<full_disk> xs:integer (0 < *value* <= 6) </full_disk> [0..1]
<number_dimensions> xs:integer (0 <= *value* <= 4) </number_dimensions> [0..1]
<instrument_type> InstrumentClassification </instrument_type> [0..*]
<comment> xs:string </comment> [1]
<time_period> ... </time_period> [1]
<group_name> xs:string </group_name> [0..1]
<sensing_type> SensingType </sensing_type> [1]
<observing_domain> ObservingDomain1 </observing_domain> [1]
<observing_domain_detail> ObservingDomain2 </observing_domain_detail> [1]
<cadence_s> xs:integer </cadence_s> [0..1]
</instr>
Schema Component Representation
<xs:element name="instr" type="Instrument"/>

6.3.2 Element: observatory

Name	observatory
Type	Observatory
Nillable	no
Abstract	no

Documentation attributes connected with observatories
XML Instance Representation
<observatory>
<observatory_name> ... </observatory_name> [1]
<observatory_type> ObsType </observatory_type> [1]
<observatory_complete_name> ... </observatory_complete_name> [1]
<status> observatory_status </status> [1]
<description> xs:string </description> [0..1]
<location> ObsLocation </location> [1]
<time_coverage> TimePeriod </time_coverage> [1]
<time_insertion> Time </time_insertion> [0..1]
<sat_id> SatId </sat_id> [0..1]
</observatory>
Schema Component Representation
<xs:element name="observatory" type="Observatory"/>

6.3.3 Element: observatory_instrument_id

Name	observatory_instrument_id
Type	anyType

Nillable no
Abstract no
XML Instance Representation
<observatory_instrument_id> ... </observatory_instrument_id>
Schema Component Representation
<xs:element name="observatory_instrument_id"/>

6.4 Global Definitions

6.4.1 Complex Type: Instrument

Super-types: None
Sub-types: None
Name Instrument
Abstract no
Documentation defined type of instrument class
XML Instance Representation
<...>
<observatory_instrument_id> ns1:instrument </observatory_instrument_id> [1]
<instrument_name> ... </instrument_name> [1]
<observatory_name> ... </observatory_name> [1]
<description> xs:string </description> [0..1]
<observable_entity> ObservationEntity </observable_entity> [0..1]
<observable_entity_specification> ObservableEntity2 </observable_entity_specification> [0..1]
<full_disk> xs:integer (0 < *value* <= 6) </full_disk> [0..1]
<number_dimensions> xs:integer (0 <= *value* <= 4) </number_dimensions> [0..1]
<instrument_type> InstrumentClassification </instrument_type> [0..*]
<comment> xs:string </comment> [1]
<time_period> ... </time_period> [1]
<group_name> xs:string </group_name> [0..1]
<sensing_type> SensingType </sensing_type> [1]
<observing_domain> ObservingDomain1 </observing_domain> [1]
<observing_domain_detail> ObservingDomain2 </observing_domain_detail> [1]
<cadence_s> xs:integer </cadence_s> [0..1]
</...>
Schema Component Representation
<xs:complexType name="Instrument">
<xs:sequence>
<xs:element name="observatory_instrument_id" type="ns1:instrument" maxOccurs="1" minOccurs="1"/>
<xs:element name="instrument_name" maxOccurs="1"/>
<xs:element ref="observatory_name" maxOccurs="1" minOccurs="1"/>
<xs:element name="description" type="xs:string" maxOccurs="1" minOccurs="0"/>
<xs:element name="observable_entity" type="ObservationEntity" maxOccurs="1" minOccurs="0"/>

<xs:element name="observable_entity_specification" type="ObservableEntity2" maxOccurs="1" minOccurs="0"/>
<xs:element name="full_disk" maxOccurs="1" minOccurs="0">
<xs:simpleType>
<xs:restriction base="xs:integer">
<xs:minExclusive value="0"/>
<xs:maxInclusive value="6"/>
</xs:restriction>
</xs:simpleType>
</xs:element>
<xs:element name="number_dimensions" maxOccurs="1" minOccurs="0">
<xs:simpleType>
<xs:restriction base="xs:integer">
<xs:minInclusive value="0"/>
<xs:maxInclusive value="4"/>
</xs:restriction>
</xs:simpleType>
</xs:element>
<xs:element name="instrument_type" type="InstrumentClassification" maxOccurs="unbounded" minOccurs="0"/>
<xs:element name="comment" type="xs:string"/>
<xs:element ref="time_period" maxOccurs="1" minOccurs="1"/>
<xs:element name="group_name" type="xs:string" maxOccurs="1" minOccurs="0"/>
<xs:element name="sensing_type" type="SensingType" maxOccurs="1" minOccurs="1"/>
<xs:element name="observing_domain" type="ObservingDomain1" maxOccurs="1" minOccurs="1"/>
<xs:element name="observing_domain_detail" type="ObservingDomain2" maxOccurs="1" minOccurs="1"/>
<xs:element name="cadence_s" type="xs:integer" maxOccurs="1" minOccurs="0"/>
</xs:sequence>
</xs:complexType>

6.4.2 Complex Type: ObsType

Super-types: None

Sub-types: None

Name ObsType

Abstract no

XML Instance Representation
<...>
Start Choice [1]
<location> Location </location> [1]
<sat_type> xs:string </sat_type> [1]
<research_object> xs:string </research_object> [1]
<sat_id> SatId </sat_id> [1]
<orbit_height> xs:string </orbit_height> [1]
<orbit_orientation> xs:string </orbit_orientation> [1]
<sat_id> SatId </sat_id> [1]

End Choice
</...>
Schema Component Representation
<xs:complexType name="ObsType">
<xs:choice>
<xs:sequence>
<xs:element name="location" type="Location"/>
</xs:sequence>
<xs:sequence>
<xs:element name="sat_type" type="xs:string"/>
<xs:element name="research_object" type="xs:string"/>
<xs:element name="sat_id" type="SatId"/>
</xs:sequence>
<xs:sequence>
<xs:element name="orbit_height" type="xs:string"/>
<xs:element name="orbit_orientation" type="xs:string"/>
<xs:element name="sat_id" type="SatId"/>
</xs:sequence>
</xs:choice>
</xs:complexType>

6.4.3 Complex Type: Observatory

Super-types: None

Sub-types: None

Name Observatory

Abstract no

XML Instance Representation
<...>
<observatory_name> ... </observatory_name> [1]
<observatory_type> ObsType </observatory_type> [1]
<observatory_complete_name> ... </observatory_complete_name> [1]
<status> observatory_status </status> [1]
<description> xs:string </description> [0..1]
<location> ObsLocation </location> [1]
<time_coverage> TimePeriod </time_coverage> [1]
<time_insertion> Time </time_insertion> [0..1]
<sat_id> SatId </sat_id> [0..1]
</...>
Schema Component Representation
<xs:complexType name="Observatory">
<xs:sequence>
<xs:element ref="observatory_name" maxOccurs="1" minOccurs="1"/>
<xs:element name="observatory_type" type="ObsType" maxOccurs="1"/>
<xs:element name="observatory_complete_name"/>
<xs:element name="status" type="observatory_status" maxOccurs="1" minOccurs="1"/>
<xs:element name="description" type="xs:string" maxOccurs="1" minOccurs="0"/>
<xs:element name="location" type="ObsLocation" maxOccurs="1" minOccurs="1"/>

<xs:element name="time_coverage" type="TimePeriod" maxOccurs="1" minOccurs="1"/>
<xs:element name="time_insertion" type="Time" maxOccurs="1" minOccurs="0"/>
<xs:element name="sat_id" type="SatId" maxOccurs="1" minOccurs="0"/>
</xs:sequence>
</xs:complexType>

6.4.4 Complex Type: observatory_location

Super-types: None

Sub-types: None

Name observatory_location

Abstract no

XML Instance Representation
<...>
Start Choice [1]
<P2> xs:string </P2> [1]
<P3> xs:string </P3> [1]
<ILS-T> xs:string </ILS-T> [1]
<ILS-O> xs:string </ILS-O> [1]
End Choice
</...>
Schema Component Representation
<xs:complexType name="observatory_location">
<xs:choice>
<xs:sequence>
<xs:element name="P2" type="xs:string"/>
<xs:element name="P3" type="xs:string"/>
</xs:sequence>
<xs:sequence>
<xs:element name="ILS-T" type="xs:string"/>
<xs:element name="ILS-O" type="xs:string"/>
</xs:sequence>
</xs:choice>
</xs:complexType>

6.4.5 Simple Type: InstrumentClassification

Super-types: xs:string < **InstrumentClassification** (by restriction)

Sub-types: None

Name InstrumentClassification

- Base XSD Type: string

Content

- *value* comes from list: {'imager'|'radiometer'|'photometer'|'cosmic-ray'|'shocks'|'electron-drift'|'high-energy'|'plasma'|'spectrometer'|'heliograph'|'coronagraph'|'SEP'|'waves'|'K-line'|'radioheliograph'|'magnetograph'|'oscillations'|'composition'|'polarimeter'|'

magnetometer'|'WhiteL'|'H-alpha'|'He10830'|'LOS-velocity'|'dust'|'irradiance'}

Schema Component Representation

```
<xs:simpleType name="InstrumentClassification">
<xs:restriction base="xs:string">
<xs:enumeration value="imager"/>
<xs:enumeration value="radiometer"/>
<xs:enumeration value="photometer"/>
<xs:enumeration value="cosmic-ray"/>
<xs:enumeration value="shocks"/>
<xs:enumeration value="electron-drift"/>
<xs:enumeration value="high-energy"/>
<xs:enumeration value="plasma"/>
<xs:enumeration value="spectrometer"/>
<xs:enumeration value="heliograph"/>
<xs:enumeration value="coronagraph"/>
<xs:enumeration value="SEP"/>
<xs:enumeration value="waves"/>
<xs:enumeration value="K-line"/>
<xs:enumeration value="radioheliograph"/>
<xs:enumeration value="magnetograph"/>
<xs:enumeration value="oscillations"/>
<xs:enumeration value="composition"/>
<xs:enumeration value="polarimeter"/>
<xs:enumeration value="magnetometer"/>
<xs:enumeration value="WhiteL"/>
<xs:enumeration value="H-alpha"/>
<xs:enumeration value="He10830"/>
<xs:enumeration value="LOS-velocity"/>
<xs:enumeration value="dust"/>
<xs:enumeration value="irradiance"/>
</xs:restriction>
</xs:simpleType>
```

6.4.6 Simple Type: ObsLocation

Super-types: xs:string < **ObsLocation** (by restriction)

Sub-types: None

Name ObsLocation

- Base XSD Type: string

Content

- *value* comes from list: {'ERO'|'SRO'|'MRO'|'VRO'|'HP1'|'HP2'|'HP2f'|'HP3'|'HP3f'|'HP4'|'HP4f'|'LRO'|'LPO'|'GBO'|'LBO'|'MBO'}

Schema Component Representation

```
<xs:simpleType name="ObsLocation">
<xs:restriction base="xs:string">
```

<xs:enumeration value="ERO"/>
<xs:enumeration value="SRO"/>
<xs:enumeration value="MRO"/>
<xs:enumeration value="VRO"/>
<xs:enumeration value="HP1"/>
<xs:enumeration value="HP2"/>
<xs:enumeration value="HP2f"/>
<xs:enumeration value="HP3"/>
<xs:enumeration value="HP3f"/>
<xs:enumeration value="HP4"/>
<xs:enumeration value="HP4f"/>
<xs:enumeration value="LRO"/>
<xs:enumeration value="LPO"/>
<xs:enumeration value="GBO"/>
<xs:enumeration value="LBO"/>
<xs:enumeration value="MBO"/>
</xs:restriction>
</xs:simpleType>

6.4.7 Simple Type: ObservableEntity2

Super-types: xs:string < **ObservableEntity2** (by restriction)

Sub-types: None

Name ObservableEntity2

- Base XSD Type: string

Content

- *value* comes from list: {'GMR'|'HXR'|'SXR'|'UV'|'visible'|'EUV'|'radio'|'microwave'|'charged'|'energetic'|'energ/neut'|'neutral'|'magnetic'|'elect/magn.'|'electric'|'gravity'}

Schema Component Representation
<xs:simpleType name="ObservableEntity2">
<xs:restriction base="xs:string">
<xs:enumeration value="GMR"/>
<xs:enumeration value="HXR"/>
<xs:enumeration value="SXR"/>
<xs:enumeration value="UV"/>
<xs:enumeration value="visible"/>
<xs:enumeration value="EUV"/>
<xs:enumeration value="radio"/>
<xs:enumeration value="microwave"/>
<xs:enumeration value="charged"/>
<xs:enumeration value="energetic"/>
<xs:enumeration value="energ/neut"/>
<xs:enumeration value="neutral"/>
<xs:enumeration value="magnetic"/>
<xs:enumeration value="elect/magn."/>

<xs:enumeration value="electric"/>
<xs:enumeration value="gravity"/>
</xs:restriction>
</xs:simpleType>

6.4.8 Simple Type: ObservationEntity

Super-types: xs:string < **ObservationEntity** (by restriction)

Sub-types: None

Name ObservationEntity

- Base XSD Type: string

Content

- *value* comes from list: {'photons'|'particles'|'fields'|'dust'}

Schema Component Representation
<xs:simpleType name="ObservationEntity">
<xs:restriction base="xs:string">
<xs:enumeration value="photons"/>
<xs:enumeration value="particles"/>
<xs:enumeration value="fields"/>
<xs:enumeration value="dust"/>
</xs:restriction>
</xs:simpleType>

6.4.9 Simple Type: ObservingDomain1

Super-types: xs:string < **ObservingDomain1** (by restriction)

Sub-types: None

Name ObservingDomain1

- Base XSD Type: string

Content

- *value* comes from list: {'sun'|'Earth'|'heliosphere'|'galactic'|'Earth/L1'|'Saturn'|'Jupiter'|'Mars'|'Venus'|'comet'|'Mercury'|'planetary'|'Uranus'|'Neptune'}

Schema Component Representation
<xs:simpleType name="ObservingDomain1">
<xs:restriction base="xs:string">
<xs:enumeration value="sun"/>
<xs:enumeration value="Earth"/>
<xs:enumeration value="heliosphere"/>
<xs:enumeration value="galactic"/>
<xs:enumeration value="Earth/L1"/>
<xs:enumeration value="Saturn"/>
<xs:enumeration value="Jupiter"/>

<xs:enumeration value="Mars"/>
<xs:enumeration value="Venus"/>
<xs:enumeration value="comet"/>
<xs:enumeration value="Mercury"/>
<xs:enumeration value="planetary"/>
<xs:enumeration value="Uranus"/>
<xs:enumeration value="Neptune"/>
</xs:restriction>
</xs:simpleType>

6.4.10 Simple Type: ObservingDomain2

Super-types: xs:string < **ObservingDomain2** (by restriction)

Sub-types: None

Name ObservingDomain2

Content

- Base XSD Type: string
- *value* comes from list: {'disk/inr. cor.'|'outer corona'|'disk'|'magnetosphere'|'structure'|'interior'|'solar-wind'|'disk/helios.'|'energy release'|'aurora'|'interstellar'|'magneto/ionosphere'|'environment'|'ionosphere' }

Schema Component Representation
<xs:simpleType name="ObservingDomain2">
<xs:restriction base="xs:string">
<xs:enumeration value="disk/inr. cor."/>
<xs:enumeration value="outer corona"/>
<xs:enumeration value="disk"/>
<xs:enumeration value="magnetosphere"/>
<xs:enumeration value="structure"/>
<xs:enumeration value="interior"/>
<xs:enumeration value="solar-wind"/>
<xs:enumeration value="disk/helios."/>
<xs:enumeration value="energy release"/>
<xs:enumeration value="aurora"/>
<xs:enumeration value="interstellar"/>
<xs:enumeration value="magneto/ionosphere"/>
<xs:enumeration value="environment"/>
<xs:enumeration value="ionosphere"/>
</xs:restriction>
</xs:simpleType>

6.4.11 Simple Type: SensingType

Super-types: xs:string < **SensingType** (by restriction)

Sub-types: None

Name SensingType

- Base XSD Type: string

Content

- *value* comes from list: {'remote'|'in-situ'}

Schema Component Representation
<xs:simpleType name="SensingType">
<xs:restriction base="xs:string">
<xs:enumeration value="remote"/>
<xs:enumeration value="in-situ"/>
</xs:restriction>
</xs:simpleType>

6.4.12 Simple Type: observatory_status

Super-types: xs:string < **observatory_status** (by restriction)

Sub-types: None

Name observatory_status

- Base XSD Type: string

Content

- *value* comes from list: {'P'|'O'|'D'}

Schema Component Representation
<xs:simpleType name="observatory_status">
<xs:restriction base="xs:string">
<xs:enumeration value="P"/>
<xs:enumeration value="O"/>
<xs:enumeration value="D"/>
</xs:restriction>
</xs:simpleType>

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7 ILS

7.1 Table of Contents

- Schema Document Properties
- Global Declarations
  - Element: **key_events**
  - Element: **trajectories**
- Global Definitions
  - Complex Type: **KeyEvents**
  - Complex Type: **TargetObject**

- Complex Type: **Trajectories**
- Simple Type: **EventType**
- Simple Type: **Planets**

7.2 Schema Document Properties

Target Namespace	None
Element and Attribute Namespaces	• Global element and attribute declarations belong to this schema's target namespace. • By default, local element declarations have no namespace. • By default, local attribute declarations have no namespace.
Schema Composition	• This schema includes components from the following schema document(s): ○ helio_data_model-generalTypes.xsd

7.2.1 Declared Namespaces

Prefix	Namespace
xml	http://www.w3.org/XML/1998/namespace
xs	http://www.w3.org/2001/XMLSchema

Schema Component Representation
<xs:schema>
<xs:include schemaLocation="helio_data_model-generalTypes.xsd"/>
...
</xs:schema>

7.3 Global Declarations

7.3.1 Element: key_events

Name key_events
Type KeyEvents
Nillable no
Abstract no
XML Instance Representation
<key_events>
<observatory_name> ... </observatory_name> [1]
<sat_id> SatId </sat_id> [1]
<time_start> Time </time_start> [1]
<type> EventType </type> [1]
<desciption> xs:string </desciption> [0..*]
</key_events>
Schema Component Representation

<xs:element name="key_events" type="KeyEvents"/>

7.3.2 Element: trajectories

Name trajectories
Type Trajectories
Nillable no
Abstract no
XML Instance Representation
<trajectories>
<time> ... </time> [1]
<julian_date> JulianDate </julian_date> [1]
<location> ... </location> [1..*]
<target_object> TargetObject </target_object> [1]
<cadence> DeltaTime </cadence> [0..1]
<method> xs:string </method> [0..1]
<id> ID </id> [1]
</trajectories>
Schema Component Representation
<xs:element name="trajectories" type="Trajectories"/>

7.4 Global Definitions

7.4.1 Complex Type: KeyEvents

Super-types: None
Sub-types: None
Name KeyEvents
Abstract no
XML Instance Representation
<...>
<observatory_name> ... </observatory_name> [1]
<sat_id> SatId </sat_id> [1]
<time_start> Time </time_start> [1]
<type> EventType </type> [1]
<desciption> xs:string </desciption> [0..*]
</...>
Schema Component Representation
<xs:complexType name="KeyEvents">
<xs:sequence>
<xs:element ref="observatory_name" maxOccurs="1" minOccurs="1"/>
<xs:element name="sat_id" type="SatId" maxOccurs="1" minOccurs="1"/>
<xs:element name="time_start" type="Time" maxOccurs="1" minOccurs="1"/>
<xs:element name="type" type="EventType" maxOccurs="1" minOccurs="1"/>
<xs:element name="desciption" type="xs:string" maxOccurs="unbounded"
minOccurs="0"/>

</xs:sequence>
</xs:complexType>

7.4.2 Complex Type: TargetObject

Super-types: None

Sub-types: None

Name TargetObject

Abstract no

XML Instance Representation
<...>
Start Choice [1]
<observatory_name> ... </observatory_name> [1]
<planets> Planets </planets> [1]
End Choice
</...>
Schema Component Representation
<xs:complexType name="TargetObject">
<xs:choice>
<xs:element ref="observatory_name" maxOccurs="1" minOccurs="1"/>
<xs:element name="planets" type="Planets"/>
</xs:choice>
</xs:complexType>

7.4.3 Complex Type: Trajectories

Super-types: None

Sub-types: None

Name Trajectories

Abstract no

XML Instance Representation
<...>
<time> ... </time> [1]
<julian_date> JulianDate </julian_date> [1]
<location> ... </location> [1..*]
<target_object> TargetObject </target_object> [1]
<cadence> DeltaTime </cadence> [0..1]
<method> xs:string </method> [0..1]
<id> ID </id> [1]
</...>
Schema Component Representation
<xs:complexType name="Trajectories">
<xs:sequence>
<xs:element ref="time" maxOccurs="1" minOccurs="1"/>
<xs:element name="julian_date" type="JulianDate"/>
<xs:element ref="location" maxOccurs="unbounded" minOccurs="1"/>

```
<xs:element name="target_object" type="TargetObject" maxOccurs="1" minOccurs="1"/>
<xs:element name="cadence" type="DeltaTime" maxOccurs="1" minOccurs="0"/>
<xs:element name="method" type="xs:string" maxOccurs="1" minOccurs="0"/>
<xs:element name="id" type="ID"/>
</xs:sequence>
</xs:complexType>
```

7.4.4 Simple Type: EventType

Super-types: xs:string < **EventType** (by restriction)

Sub-types: None

Name EventType

Content

- Base XSD Type: string
- *value* comes from list: {'event'|'insertion'|'flyby'|'depart'}

Schema Component Representation

```
<xs:simpleType name="EventType">
<xs:restriction base="xs:string">
<xs:enumeration value="event"/>
<xs:enumeration value="insertion"/>
<xs:enumeration value="flyby"/>
<xs:enumeration value="depart"/>
</xs:restriction>
</xs:simpleType>
```

7.4.5 Simple Type: Planets

Super-types: xs:string < **Planets** (by restriction)

Sub-types: None

Name Planets

Content

- Base XSD Type: string
- *value* comes from list: {'SATURN'|'JUPITER'|'NEPTUNE'|'URANUS'|'VENUS'|'MERCURY'|'MARS'|'EARTH'}

Schema Component Representation

```
<xs:simpleType name="Planets">
<xs:restriction base="xs:string">
<xs:enumeration value="SATURN"/>
<xs:enumeration value="JUPITER"/>
<xs:enumeration value="NEPTUNE"/>
<xs:enumeration value="URANUS"/>
<xs:enumeration value="VENUS"/>
<xs:enumeration value="MERCURY"/>
```

<xs:enumeration value="MARS"/>
<xs:enumeration value="EARTH"/>
</xs:restriction>
</xs:simpleType>

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8 UOC

8.1 Table of Contents

- Schema Document Properties
- Global Declarations
  - Element: **planetary_observation**
  - Element: **pointing**
  - Element: **uoc_instrument**
- Global Definitions
  - Complex Type: **FOVSize**
  - Complex Type: **Planetary**
  - Complex Type: **Pointing**
  - Complex Type: **SizePixel**
  - Complex Type: **Spectral**
  - Complex Type: **UOCInstrument**
  - Simple Type: **SpectralId**

8.2 Schema Document Properties

Target Namespace	None
Element and Attribute Namespaces	• Global element and attribute declarations belong to this schema's target namespace. • By default, local element declarations have no namespace. • By default, local attribute declarations have no namespace.
Schema Composition	• This schema includes components from the following schema document(s): ○ helio_data_model-generalTypes.xsd

8.2.1 Declared Namespaces

Prefix	Namespace
xml	http://www.w3.org/XML/1998/namespace
xs	http://www.w3.org/2001/XMLSchema

Schema Component Representation
<xs:schema>

<xs:include schemaLocation="helio_data_model-generalTypes.xsd"/>
...
</xs:schema>

8.3 Global Declarations

8.3.1 Element: planetary_observation

Name planetary_observation
Type Planetary
Nillable no
Abstract no
XML Instance Representation
<planetary_observation>
<instrument> ... </instrument> [1]
<provider> xs:string </provider> [1]
<time_period> ... </time_period> [1]
<url> URL </url> [1]
<ancillary_filename> xs:string </ancillary_filename> [1]
<ancillary_info> xs:string </ancillary_info> [0..*]
<file_type> xs:string </file_type> [0..1]
<file_size> FileSize </file_size> [0..1]
</planetary_observation>
Schema Component Representation
<xs:element name="planetary_observation" type="Planetary"/>

8.3.2 Element: pointing

Name pointing
Type Pointing
Nillable no
Abstract no
XML Instance Representation
<pointing>
<rot_carr> xs:integer </rot_carr> [1]
<fov_centre> Location </fov_centre> [1..*]
<fov_size> FOVSize </fov_size> [1]
<size_pixel> SizePixel </size_pixel> [1]
<r_sun> xs:double </r_sun> [1]
<fov_br> BoundingRectangle </fov_br> [1..*]
<filter_name> xs:string </filter_name> [1]
<spectral_table_id> SpectralId </spectral_table_id> [1]
<instrument_table_id> ... </instrument_table_id> [1]
<time_period> ... </time_period> [1]
</pointing>
Schema Component Representation

<xs:element name="pointing" type="Pointing"/>

8.3.3 Element: uoc_instrument

Name uoc_instrument
Type UOCInstrument
Nillable no
Abstract no
XML Instance Representation
<uoc_instrument>
<instrument> ... </instrument> [1]
<observatory_name> ... </observatory_name> [1]
<orbit> ... </orbit> [1]
<instrument_type> ... </instrument_type> [1]
<sampling_method> ... </sampling_method> [1]
<output_type> ... </output_type> [1]
<observation_mode> ... </observation_mode> [1]
<energy_regime> ... </energy_regime> [1]
<physical_param> ... </physical_param> [1]
</uoc_instrument>
Schema Component Representation
<xs:element name="uoc_instrument" type="UOCInstrument"/>

8.4 Global Definitions

8.4.1 Complex Type: FOVSize

Super-types: None
Sub-types: None
Name FOVSize
Abstract no
XML Instance Representation
<...>
<long_width_arcsec> xs:double </long_width_arcsec> [1]
<lat_width_arcsec> xs:double </lat_width_arcsec> [1]
</...>
Schema Component Representation
<xs:complexType name="FOVSize">
<xs:sequence>
<xs:element name="long_width_arcsec" type="xs:double" maxOccurs="1" minOccurs="1"/>
<xs:element name="lat_width_arcsec" type="xs:double" maxOccurs="1" minOccurs="1"/>
</xs:sequence>
</xs:complexType>

8.4.2 Complex Type: Planetary

Super-types: None

Sub-types: None

Name Planetary

Abstract no

XML Instance Representation

<...>
<instrument> ... </instrument> [1]
<provider> xs:string </provider> [1]
<time_period> ... </time_period> [1]
<url> URL </url> [1]
<ancillary_filename> xs:string </ancillary_filename> [1]
<ancillary_info> xs:string </ancillary_info> [0..*]
<file_type> xs:string </file_type> [0..1]
<file_size> FileSize </file_size> [0..1]
</...>

Schema Component Representation

<xs:complexType name="Planetary">
<xs:sequence>
<xs:element ref="instrument" maxOccurs="1" minOccurs="1"/>
<xs:element name="provider" type="xs:string" maxOccurs="1" minOccurs="1"/>
<xs:element ref="time_period" maxOccurs="1" minOccurs="1"/>
<xs:element name="url" type="URL" maxOccurs="1" minOccurs="1"/>
<xs:element name="ancillary_filename" type="xs:string" maxOccurs="1" minOccurs="1"/>
<xs:element name="ancillary_info" type="xs:string" maxOccurs="unbounded"
minOccurs="0"/>
<xs:element name="file_type" type="xs:string" maxOccurs="1" minOccurs="0"/>
<xs:element name="file_size" type="FileSize" maxOccurs="1" minOccurs="0"/>
</xs:sequence>
</xs:complexType>

8.4.3 Complex Type: Pointing

Super-types: None

Sub-types: None

Name Pointing

Abstract no

XML Instance Representation

<...>
<rot_carr> xs:integer </rot_carr> [1]
<fov_centre> Location </fov_centre> [1..*]
<fov_size> FOVSize </fov_size> [1]
<size_pixel> SizePixel </size_pixel> [1]
<r_sun> xs:double </r_sun> [1]
<fov_br> BoundingRectangle </fov_br> [1..*]
<filter_name> xs:string </filter_name> [1]

<spectral_table_id> SpectralId </spectral_table_id> [1]
<instrument_table_id> ... </instrument_table_id> [1]
<time_period> ... </time_period> [1]
</...>
Schema Component Representation
<xs:complexType name="Pointing">
<xs:sequence>
<xs:element name="rot_carr" type="xs:integer"/>
<xs:element name="fov_centre" type="Location" maxOccurs="unbounded"
minOccurs="1"/>
<xs:element name="fov_size" type="FOVSize"/>
<xs:element name="size_pixel" type="SizePixel"/>
<xs:element name="r_sun" type="xs:double"/>
<xs:element name="fov_br" type="BoundingRectangle" maxOccurs="unbounded"
minOccurs="1"/>
<xs:element name="filter_name" type="xs:string"/>
<xs:element name="spectral_table_id" type="SpectralId"/>
<xs:element name="instrument_table_id"/>
<xs:element ref="time_period" maxOccurs="1" minOccurs="1"/>
</xs:sequence>
</xs:complexType>

8.4.4 Complex Type: SizePixel

Super-types: None
Sub-types: None
Name SizePixel
Abstract no
XML Instance Representation
<...>
<cdelt1> ... </cdelt1> [1]
<cdelt2> ... </cdelt2> [1]
</...>
Schema Component Representation
<xs:complexType name="SizePixel">
<xs:sequence>
<xs:element name="cdelt1" maxOccurs="1" minOccurs="1"/>
<xs:element name="cdelt2" maxOccurs="1" minOccurs="1"/>
</xs:sequence>
</xs:complexType>

8.4.5 Complex Type: Spectral

Super-types: None
Sub-types: None
Name Spectral

Abstract no
XML Instance Representation
<...>
<spectral_id> SpectralId </spectral_id> [1]
<unit_wavelength> ... </unit_wavelength> [1]
<cdelt_wavelength> ... </cdelt_wavelength> [1]
<cdelt_time> ... </cdelt_time> [1]
<window_count> ... </window_count> [1]
<slit_size> ... </slit_size> [1]
Start Sequence [1..*]
<wavelength_min> ... </wavelength_min> [1]
<wavelength_max> ... </wavelength_max> [1]
<wavelength> ... </wavelength> [1]
End Sequence
</...>
Schema Component Representation
<xs:complexType name="Spectral">
<xs:sequence>
<xs:element name="spectral_id" type="SpectralId"/>
<xs:element name="unit_wavelength"/>
<xs:element name="cdelt_wavelength"/>
<xs:element name="cdelt_time"/>
<xs:element name="window_count"/>
<xs:element name="slit_size"/>
<xs:sequence maxOccurs="unbounded" minOccurs="1">
<xs:element name="wavelength_min" maxOccurs="1" minOccurs="1"/>
<xs:element name="wavelength_max" maxOccurs="1" minOccurs="1"/>
<xs:element name="wavelength" maxOccurs="1" minOccurs="1"/>
</xs:sequence>
</xs:sequence>
</xs:complexType>

8.4.6 Complex Type: UOCInstrument

Super-types: None
Sub-types: None
Name UOCInstrument
Abstract no
XML Instance Representation
<...>
<instrument> ... </instrument> [1]
<observatory_name> ... </observatory_name> [1]
<orbit> ... </orbit> [1]
<instrument_type> ... </instrument_type> [1]
<sampling_method> ... </sampling_method> [1]
<output_type> ... </output_type> [1]
<observation_mode> ... </observation_mode> [1]
<energy_regime> ... </energy_regime> [1]

<physical_param> ... </physical_param> [1]
</...>
Schema Component Representation
<xs:complexType name="UOCInstrument">
<xs:sequence>
<xs:element ref="instrument" maxOccurs="1" minOccurs="1"/>
<xs:element ref="observatory_name" maxOccurs="1" minOccurs="1"/>
<xs:element name="orbit"/>
<xs:element name="instrument_type"/>
<xs:element name="sampling_method"/>
<xs:element name="output_type"/>
<xs:element name="observation_mode"/>
<xs:element name="energy_regime"/>
<xs:element name="physical_param"/>
</xs:sequence>
</xs:complexType>

8.4.7 Simple Type: SpectralId

Super-types: xs:string < **SpectralId** (by restriction)

Sub-types: None

Name SpectralId

Content
- Base XSD Type: string

Schema Component Representation
<xs:simpleType name="SpectralId">
<xs:restriction base="xs:string"/>
</xs:simpleType>

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9 DPAS

9.1 Table of Contents

- Schema Document Properties
- Global Declarations
  - Element: **data_link**
- Global Definitions
  - Complex Type: **DPASResult**
  - Simple Type: **Provider**

9.2 Schema Document Properties

Target Namespace	None
Element and Attribute Namespaces	• Global element and attribute declarations belong to this schema's target namespace. • By default, local element declarations have no namespace. • By default, local attribute declarations have no namespace.
Schema Composition	• This schema includes components from the following schema document(s): o helio_data_model-generalTypes.xsd

9.2.1 Declared Namespaces

Prefix	Namespace
xml	http://www.w3.org/XML/1998/namespace
xs	http://www.w3.org/2001/XMLSchema

Schema Component Representation
<xs:schema>
<xs:include schemaLocation="helio_data_model-generalTypes.xsd"/>
...
</xs:schema>

9.3 Global Declarations

9.3.1 Element: data_link

Name data_link
Type DPASResult
Nillable no
Abstract no
XML Instance Representation
<data_link>
<instrument> ... </instrument> [1]
<provider_instr_key> xs:string </provider_instr_key> [1]
<url> URL </url> [1]
<provider> Provider </provider> [1]
<time_period> ... </time_period> [1]
</data_link>
Schema Component Representation
<xs:element name="data_link" type="DPASResult"/>

9.4 Global Definitions

9.4.1 Complex Type: DPASResult

Super-types: None

Sub-types: None

Name DPASResult

Abstract no

XML Instance Representation
<...>
<instrument> ... </instrument> [1]
<provider_instr_key> xs:string </provider_instr_key> [1]
<url> URL </url> [1]
<provider> Provider </provider> [1]
<time_period> ... </time_period> [1]
</...>
Schema Component Representation
<xs:complexType name="DPASResult">
<xs:sequence>
<xs:element ref="instrument" maxOccurs="1" minOccurs="1"/>
<xs:element name="provider_instr_key" type="xs:string" maxOccurs="1" minOccurs="1"/>
<xs:element name="url" type="URL" maxOccurs="1" minOccurs="1"/>
<xs:element name="provider" type="Provider" maxOccurs="1" minOccurs="1"/>
<xs:element ref="time_period"/>
</xs:sequence>
</xs:complexType>

9.4.2 Simple Type: Provider

Super-types: xs:string < **Provider** (by restriction)

Sub-types: None

Name Provider

- Base XSD Type: string

Content

- *value* comes from list: {'VSO'|'CDAWEB'|'UOC'|'DIR'|'SODA'}

Schema Component Representation
<xs:simpleType name="Provider">
<xs:restriction base="xs:string">
<xs:enumeration value="VSO"/>
<xs:enumeration value="CDAWEB"/>
<xs:enumeration value="UOC"/>
<xs:enumeration value="DIR"/>
<xs:enumeration value="SODA"/>
</xs:restriction>
</xs:simpleType>

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10 DES

10.1 Table of Contents

- Schema Document Properties
- Global Declarations
  - Element: **des_request**
  - Element: **des_result**
- Global Definitions
  - Complex Type: **DESRequest**
  - Complex Type: **DESResult**
  - Simple Type: **DESFunction**
  - Simple Type: **DESParameter**

10.2 Schema Document Properties

Target Namespace	None
Element and Attribute Namespaces	• Global element and attribute declarations belong to this schema's target namespace. • By default, local element declarations have no namespace. • By default, local attribute declarations have no namespace.
Schema Composition	• This schema includes components from the following schema document(s): ○ helio_data_model-generalTypes.xsd

10.2.1 Declared Namespaces

Prefix	Namespace
xml	http://www.w3.org/XML/1998/namespace
xs	http://www.w3.org/2001/XMLSchema

Schema Component Representation

```
<xs:schema>
<xs:include schemaLocation="helio_data_model-generalTypes.xsd"/>
...
</xs:schema>
```

10.3 Global Declarations

10.3.1 Element: des_request

Name des_request
Type DESRequest
Nillable no
Abstract no
XML Instance Representation
<des_request>
<observatory_name> ... </observatory_name> [1..*]
<function> DESFunction </function> [1]
<parameter> DESParameter </parameter> [1..*]
</des_request>
Schema Component Representation
<xs:element name="des_request" type="DESRequest"/>

10.3.2 Element: des_result

Name des_result
Type DESResult
Nillable no
Abstract no
XML Instance Representation
<des_result>
Start Sequence [0..*]
<time_period> ... </time_period> [1]
<location> ... </location> [0..1]
End Sequence
</des_result>
Schema Component Representation
<xs:element name="des_result" type="DESResult"/>

10.4 Global Definitions

10.4.1 Complex Type: DESRequest

Super-types: None
Sub-types: None
Name DESRequest
Abstract no
XML Instance Representation
<...>
<observatory_name> ... </observatory_name> [1..*]
<function> DESFunction </function> [1]

<parameter> DESParameter </parameter> [1..*]
</...>
Schema Component Representation
<xs:complexType name="DESRequest">
<xs:sequence maxOccurs="1" minOccurs="1">
<xs:element ref="observatory_name" maxOccurs="unbounded" minOccurs="1"/>
<xs:element name="function" type="DESFunction" maxOccurs="1" minOccurs="1"/>
<xs:element name="parameter" type="DESParameter" maxOccurs="unbounded"
minOccurs="1"/>
</xs:sequence>
</xs:complexType>

10.4.2 Complex Type: DESResult

Super-types: None

Sub-types: None

Name DESResult

Abstract no

XML Instance Representation
<...>
Start Sequence [0..*]
<time_period> ... </time_period> [1]
<location> ... </location> [0..1]
End Sequence
</...>
Schema Component Representation
<xs:complexType name="DESResult">
<xs:sequence maxOccurs="unbounded" minOccurs="0">
<xs:element ref="time_period" maxOccurs="1" minOccurs="1"/>
<xs:element ref="location" minOccurs="0" maxOccurs="1"/>
</xs:sequence>
</xs:complexType>

10.4.3 Simple Type: DESFunction

Super-types: xs:string < **DESFunction** (by restriction)

Sub-types: None

Name DESFunction

Content

- Base XSD Type: string
- *value* comes from list: {'DERIV'}

Schema Component Representation
<xs:simpleType name="DESFunction">
<xs:restriction base="xs:string">
<xs:enumeration value="DERIV"/>

</xs:restriction>
</xs:simpleType>

10.4.4 Simple Type: DESParameter

Super-types: xs:string < **DESParameter** (by restriction)

Sub-types: None

Name DESParameter

Content
- Base XSD Type: string
- *value* comes from list: {'V'|'B'|'N'}

Schema Component Representation
<xs:simpleType name="DESParameter">
<xs:restriction base="xs:string">
<xs:enumeration value="V"/>
<xs:enumeration value="B"/>
<xs:enumeration value="N"/>
</xs:restriction>
</xs:simpleType>

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11 Instruments

11.1 Table of Contents

- Schema Document Properties
- Global Definitions
  - Simple Type: **instrument**

11.2 Schema Document Properties

Target Namespace	http://helio-vo.eu/xml/Instruments/v0.1
Version	1.03
Element and Attribute Namespaces	• Global element and attribute declarations belong to this schema's target namespace. • By default, local element declarations have no namespace. • By default, local attribute declarations have no namespace.

11.2.1 Declared Namespaces

Prefix	Namespace
Default namespace	http://www.w3.org/2001/XMLSchema
xml	http://www.w3.org/XML/1998/namespace
xs	http://www.w3.org/2001/XMLSchema

Schema Component Representation
<xs:schema targetNamespace="http://helio-vo.eu/xml/Instruments/v0.1" elementFormDefault="unqualified" attributeFormDefault="unqualified" version="1.03">
...
</xs:schema>

11.3 Global Definitions

11.3.1 Simple Type: instrument

Super-types: xs:string < **instrument** (by restriction)

Sub-types: None

Name instrument

- Base XSD Type: string

Content

- *value* comes from list:
  see below

Schema Component Representation
<xs:simpleType name="instrument">
<xs:restriction base="xs:string">
<xs:enumeration value="SMM__GRS"/>
<xs:enumeration value="SMM__HXRBS"/>
<xs:enumeration value="SMM__HXIS"/>
<xs:enumeration value="SMM__BCS"/>
<xs:enumeration value="SMM__FCS"/>
<xs:enumeration value="SMM__UVSP"/>
<xs:enumeration value="SMM__CP"/>
<xs:enumeration value="SMM__ACRIM"/>
<xs:enumeration value="HINOTORI__SXT"/>
<xs:enumeration value="HINOTORI__SOX"/>
<xs:enumeration value="HINOTORI__SGR"/>
<xs:enumeration value="HINOTORI__HXM"/>
<xs:enumeration value="HINOTORI__FLM"/>
<xs:enumeration value="HINOTORI__PXM"/>
<xs:enumeration value="HINOTORI__IMP"/>
<xs:enumeration value="HINOTORI__TEL"/>
<xs:enumeration value="CGRO__BATSE"/>
<xs:enumeration value="YOHKOH__SXT"/>
<xs:enumeration value="YOHKOH__HXT"/>
<xs:enumeration value="YOHKOH__BCS"/>

<xs:enumeration value="YOHKOH__WBS_GRS"/>
<xs:enumeration value="YOHKOH__WBS_HXS"/>
<xs:enumeration value="YOHKOH__WBS_SXS"/>
<xs:enumeration value="SOHO__EIT"/>
<xs:enumeration value="SOHO__CDS"/>
<xs:enumeration value="SOHO__SUMER"/>
<xs:enumeration value="SOHO__UVCS"/>
<xs:enumeration value="SOHO__LASCO"/>
<xs:enumeration value="SOHO__SWAN"/>
<xs:enumeration value="SOHO__MDI"/>
<xs:enumeration value="SOHO__SOI_MDI"/>
<xs:enumeration value="SOHO__GOLF"/>
<xs:enumeration value="SOHO__VIRGO"/>
<xs:enumeration value="SOHO__CELIAS"/>
<xs:enumeration value="SOHO__COSTEP"/>
<xs:enumeration value="SOHO__ERNE"/>
<xs:enumeration value="SOHO__SEM"/>
<xs:enumeration value="SPARTAN_201_2__WLC"/>
<xs:enumeration value="SPARTAN_201_2__UVCS"/>
<xs:enumeration value="TRACE__TRACE_EUV"/>
<xs:enumeration value="TRACE__TRACE_UV"/>
<xs:enumeration value="TRACE__TRACE_VIS"/>
<xs:enumeration value="CORONAS_F__SRT"/>
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<xs:enumeration value="CORONAS_F__DIFOS"/>
<xs:enumeration value="CORONAS_F__DIOGENESS"/>
<xs:enumeration value="CORONAS_F__RESIK"/>
<xs:enumeration value="RHESSI__HESSI_GMR"/>
<xs:enumeration value="RHESSI__HESSI_HXR"/>
<xs:enumeration value="CORIOLIS__SMEI"/>
<xs:enumeration value="HINODE__SOT_SP"/>
<xs:enumeration value="HINODE__SOT_FG"/>
<xs:enumeration value="HINODE__XRT"/>
<xs:enumeration value="HINODE__EIS"/>
<xs:enumeration value="STEREO_A__EUVI"/>
<xs:enumeration value="STEREO_A__COR"/>
<xs:enumeration value="STEREO_A__HI"/>
<xs:enumeration value="STEREO_A__SWAVES"/>
<xs:enumeration value="STEREO_A__SWEA"/>
<xs:enumeration value="STEREO_A__MAG"/>
<xs:enumeration value="STEREO_A__SEP"/>
<xs:enumeration value="STEREO_A__PLASTIC"/>
<xs:enumeration value="STEREO_B__EUVI"/>
<xs:enumeration value="STEREO_B__COR"/>
<xs:enumeration value="STEREO_B__HI"/>
<xs:enumeration value="STEREO_B__SWAVES"/>
<xs:enumeration value="STEREO_B__SWEA"/>
<xs:enumeration value="STEREO_B__MAG"/>
<xs:enumeration value="STEREO_B__SEP"/>
<xs:enumeration value="STEREO_B__PLASTIC"/>

```
<xs:enumeration value="IBEX__IBEX_HI"/>
<xs:enumeration value="IBEX__IBEX_LO"/>
<xs:enumeration value="PROBA_2__SWAP"/>
<xs:enumeration value="PROBA_2__LYRA"/>
<xs:enumeration value="PROBA_2__DSLP"/>
<xs:enumeration value="PROBA_2__TPMU"/>
<xs:enumeration value="SDO__HMI"/>
<xs:enumeration value="SDO__AIA_EUV"/>
<xs:enumeration value="SDO__AIA_UV"/>
<xs:enumeration value="SDO__EVE"/>
<xs:enumeration value="PROBA_3__ASPIICS"/>
<xs:enumeration value="GOES__XRS"/>
<xs:enumeration value="GOES__HEPAD"/>
<xs:enumeration value="GOES__EPS"/>
<xs:enumeration value="GOES__MAG"/>
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<xs:enumeration value="ACE__SIS"/>
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<xs:enumeration value="ACE__EPAM"/>
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<xs:enumeration value="ACE__SWICS"/>
<xs:enumeration value="ACE__SWEPAM"/>
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<xs:enumeration value="CLUSTER_1__EDI"/>
<xs:enumeration value="CLUSTER_1__STAFF"/>
<xs:enumeration value="CLUSTER_1__EFW"/>
<xs:enumeration value="CLUSTER_1__DWP"/>
<xs:enumeration value="CLUSTER_1__WHISPER"/>
<xs:enumeration value="CLUSTER_1__WBD"/>
<xs:enumeration value="CLUSTER_1__CIS"/>
<xs:enumeration value="CLUSTER_1__RAPID"/>
<xs:enumeration value="CLUSTER_2__PEACE"/>
<xs:enumeration value="CLUSTER_2__FGM"/>
<xs:enumeration value="CLUSTER_2__EDI"/>
<xs:enumeration value="CLUSTER_2__STAFF"/>
<xs:enumeration value="CLUSTER_2__EFW"/>
<xs:enumeration value="CLUSTER_2__DWP"/>
<xs:enumeration value="CLUSTER_2__WHISPER"/>
<xs:enumeration value="CLUSTER_2__WBD"/>
<xs:enumeration value="CLUSTER_2__CIS"/>
<xs:enumeration value="CLUSTER_2__RAPID"/>
<xs:enumeration value="CLUSTER_3__PEACE"/>
<xs:enumeration value="CLUSTER_3__FGM"/>
<xs:enumeration value="CLUSTER_3__EDI"/>
```

<xs:enumeration value="CLUSTER_3__STAFF"/>
<xs:enumeration value="CLUSTER_3__EFW"/>
<xs:enumeration value="CLUSTER_3__DWP"/>
<xs:enumeration value="CLUSTER_3__WHISPER"/>
<xs:enumeration value="CLUSTER_3__WBD"/>
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<xs:enumeration value="CLUSTER_3__RAPID"/>
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<xs:enumeration value="CLUSTER_4__EDI"/>
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<xs:enumeration value="DOUBLESTAR_1__FGM"/>
<xs:enumeration value="DOUBLESTAR_1__HIA"/>
<xs:enumeration value="DOUBLESTAR_1__STAFF_DWP"/>
<xs:enumeration value="DOUBLESTAR_1__HEED"/>
<xs:enumeration value="DOUBLESTAR_1__HEPD"/>
<xs:enumeration value="DOUBLESTAR_1__HID"/>
<xs:enumeration value="DOUBLESTAR_2__NUADU"/>
<xs:enumeration value="DOUBLESTAR_2__FGM"/>
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<xs:enumeration value="DOUBLESTAR_2__LEID"/>
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<xs:enumeration value="THEMIS_B__SST"/>
<xs:enumeration value="THEMIS_B__SCM"/>
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<xs:enumeration value="THEMIS_C__FGM"/>
<xs:enumeration value="THEMIS_C__ESA"/>
<xs:enumeration value="THEMIS_C__SST"/>
<xs:enumeration value="THEMIS_C__SCM"/>
<xs:enumeration value="THEMIS_C__EFI"/>
<xs:enumeration value="THEMIS_D__FGM"/>
<xs:enumeration value="THEMIS_D__ESA"/>

<xs:enumeration value="THEMIS_D__SST"/>
<xs:enumeration value="THEMIS_D__SCM"/>
<xs:enumeration value="THEMIS_D__EFI"/>
<xs:enumeration value="THEMIS_E__FGM"/>
<xs:enumeration value="THEMIS_E__ESA"/>
<xs:enumeration value="THEMIS_E__SST"/>
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<xs:enumeration value="WIND__WAVES"/>
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<xs:enumeration value="WIND__SWICS"/>
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<xs:enumeration value="WIND__MASS"/>
<xs:enumeration value="WIND__KONUS"/>
<xs:enumeration value="SAMPEX__LICA"/>
<xs:enumeration value="SAMPEX__HILT"/>
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<xs:enumeration value="GEOTAIL__PWI"/>
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<xs:enumeration value="POLAR__TIMAS"/>
<xs:enumeration value="POLAR__PWI"/>
<xs:enumeration value="POLAR__HYDRA"/>
<xs:enumeration value="POLAR__TIDE"/>
<xs:enumeration value="POLAR__CEPPAD"/>
<xs:enumeration value="POLAR__CAMMICE"/>
<xs:enumeration value="POLAR__PIXIE"/>
<xs:enumeration value="POLAR__MFE"/>
<xs:enumeration value="POLAR__EFI"/>
<xs:enumeration value="POLAR__UVI"/>
<xs:enumeration value="POLAR__VIS"/>
<xs:enumeration value="FAST__ESA"/>
<xs:enumeration value="FAST__TEAMS"/>
<xs:enumeration value="FAST__?"/>
<xs:enumeration value="FAST__MAG"/>
<xs:enumeration value="IMAGE__RPI"/>
<xs:enumeration value="IMAGE__LENA"/>
<xs:enumeration value="IMAGE__MENA"/>
<xs:enumeration value="IMAGE__HENA"/>
<xs:enumeration value="IMAGE__FUV"/>
<xs:enumeration value="IMAGE__EUV"/>

```
<xs:enumeration value="TIMED__GUVI"/>
<xs:enumeration value="TIMED__TIDI"/>
<xs:enumeration value="TIMED__SABER"/>
<xs:enumeration value="TIMED__SEE"/>
<xs:enumeration value="ULYSSES__VHM_FGM"/>
<xs:enumeration value="ULYSSES__SWOOPS"/>
<xs:enumeration value="ULYSSES__SWICS"/>
<xs:enumeration value="ULYSSES__URAP"/>
<xs:enumeration value="ULYSSES__HISCALE"/>
<xs:enumeration value="ULYSSES__SCE"/>
<xs:enumeration value="ULYSSES__DUST"/>
<xs:enumeration value="ULYSSES__EPAC"/>
<xs:enumeration value="ULYSSES__COSPIN"/>
<xs:enumeration value="ULYSSES__GRB"/>
<xs:enumeration value="CASSINI__RSS"/>
<xs:enumeration value="CASSINI__RPWS"/>
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