Photometry Data Model v1.1
MIVOT serialization

Mireille Louys,

L.Michel, F. Bonnarel,

IVOA Data Model Working group

CDS and Observatoire de Strasbourg

ICube Laboratory, Strasbourg University

PhotDM version1.1

- became an IVOA recommendation this week (2022, Oct18th)
- is a revision of PhotDM version 1.0 with VODML definition
- preserves most classes and attributes
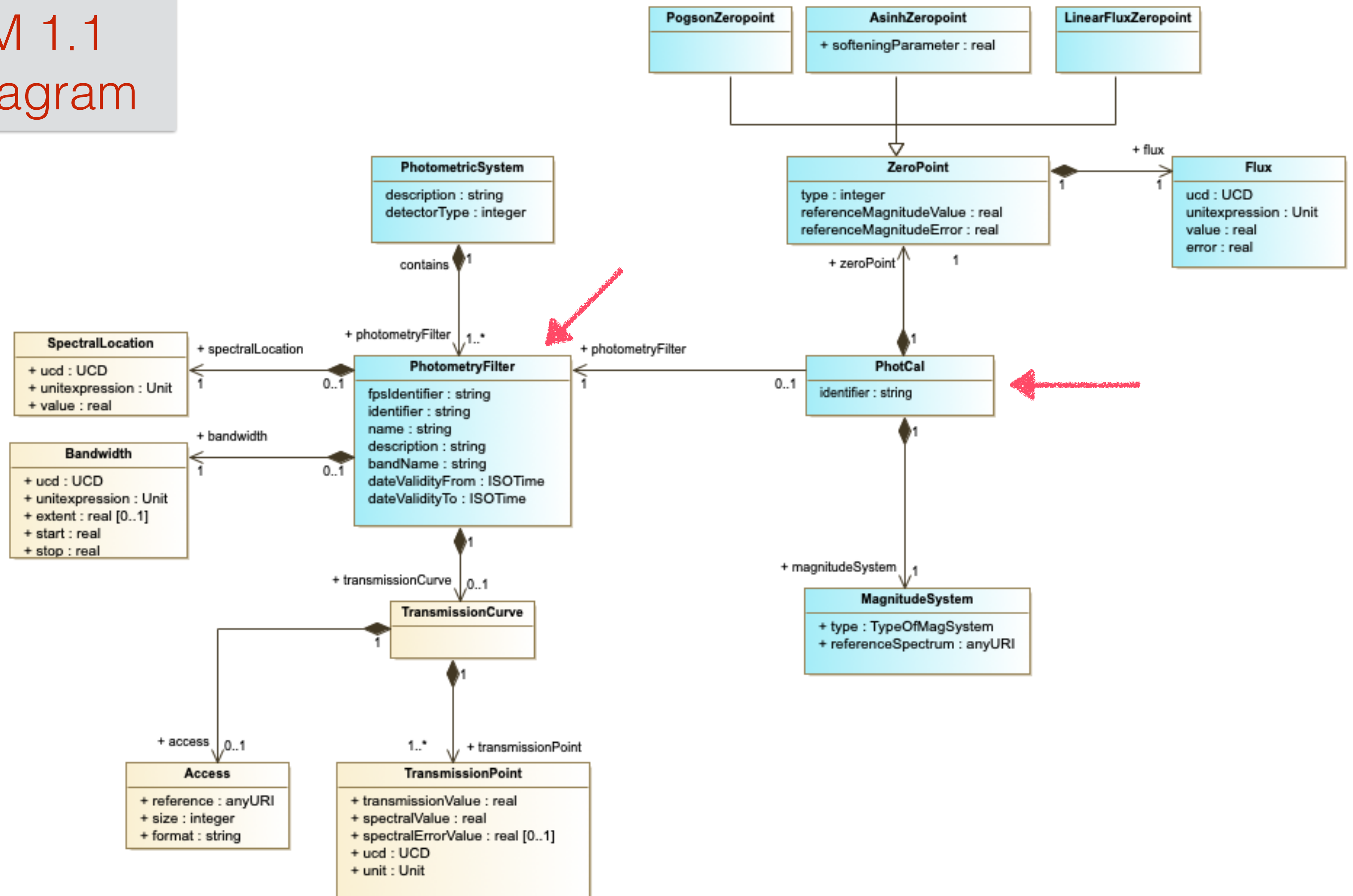- uses simple value attributes

Proposed recommendation :
 https://ivoa.net/documents/PHOTDM/20221007/index.html
Linked documents

- VODML xml document : https://ivoa.net/xml/VODML/Phot-v1.1.vodml.xml
- Data model html documentation :
  - https://wiki.ivoa.net/internal/IVOA/PhotDM11RFC/Photv1_1_PR_20220520.html

PhotDM 1.1
Class diagram

PogsonZeropoint

AsinhZeropoint
+ softeningParameter : real

LinearFluxZeropoint

ZeroPoint
type : integer
referenceMagnitudeValue : real
referenceMagnitudeError : real

Flux
ucd : UCD
unitexpression : Unit
value : real
error : real

+ flux

PhotometricSystem
description : string
detectorType : integer

contains 1

+ photometryFilter 1..*

+ zeroPoint 1

SpectralLocation
+ ucd : UCD
+ unitexpression : Unit
+ value : real

+ spectralLocation

+ photometryFilter

PhotometryFilter
fpsIdentifier : string
identifier : string
name : string
description : string
bandName : string
dateValidityFrom : ISOTime
dateValidityTo : ISOTime

0..1

1

+ photometryFilter

0..1

PhotCal
identifier : string

Bandwidth
+ ucd : UCD
+ unitexpression : Unit
+ extent : real [0..1]
+ start : real
+ stop : real

+ bandwidth

0..1

1

+ magnitudeSystem 1

+ transmissionCurve 0..1

MagnitudeSystem
+ type : TypeOfMagSystem
+ referenceSpectrum : anyURI

TransmissionCurve

1

+ access 0..1

1..* + transmissionPoint

Access
+ reference : anyURI
+ size : integer
+ format : string

TransmissionPoint
+ transmissionValue : real
+ spectralValue : real
+ spectralErrorValue : real [0..1]
+ ucd : UCD
+ unit : Unit

Serialisation of Photometry Objects

- Metadata for Photometric Calibration PhotCal +PhotometryFilter classes
  - exemple in the spec :appendix D.3.1 Photometric calibration: example 1
    - file in GitHub : https://github.com/ivoa-std/PhotDM/blob/master/serializations/photdm.2MASS.2MASS.Ks.xml
    - the set of 2MASS filters gathered as a PhotometricSystem Object :
    - https://github.com/ivoa-std/PhotDM/blob/master/serializations/2MASS_PhotSys.xml
  - exemple: XMM filters , seen as a rectangular filter profile within the bandwidth.
    - https://github.com/ivoa-std/PhotDM/blob/master/serializations/photdm.XMMSL2.XMMSL2.EB6.xml

Filter profile service output

- The SVO Filter profile service initially supported the PhotDM version 1.0 specification

- A wrapper to annotate SVO fps query response using the MIVOT PhotDM1.1 description is proposed by Laurent Michel as a prototype here :
  - https://github.com/ivoa/modelinstanceinvot-code/tree/package/photdm_builder

- This can be an alternative way to use SVO Filter data while the upgrade to PhotDM1.1 will be achieved.

☐ PhotDM classes as building blocks

- Photometry classes from PhotDM 1.1, as well as Coords and Measurement data model classes can be serialized as data model components within the MANGO data model (work in progress).

- With the MIVOT syntax, the descriptions of the various metadata components can be provided, on top of a TAP query response, for instance.
  - see 'On the fly annotation of TAP responses' presented at ADASS conference in 2021
  - https://wiki.ivoa.net/internal/IVOA/TapandTheDMs/B3-001-Part-MANGO-annotation-prototype-MLouys.pdf

Thanks for your attention

Comments ? Questions ?