Designing STC2 with VO-DML/UML

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STC-1

- STC-1 was designed as a data object characterization in observation space
- The characterization metadata were intended to be:
  - Complete
  - Self-consistent
- To borrow Markus's description:
  STC was intended to be descriptive, not prescriptive
- No need to implement all available options
- But picking random elements destroys consistency

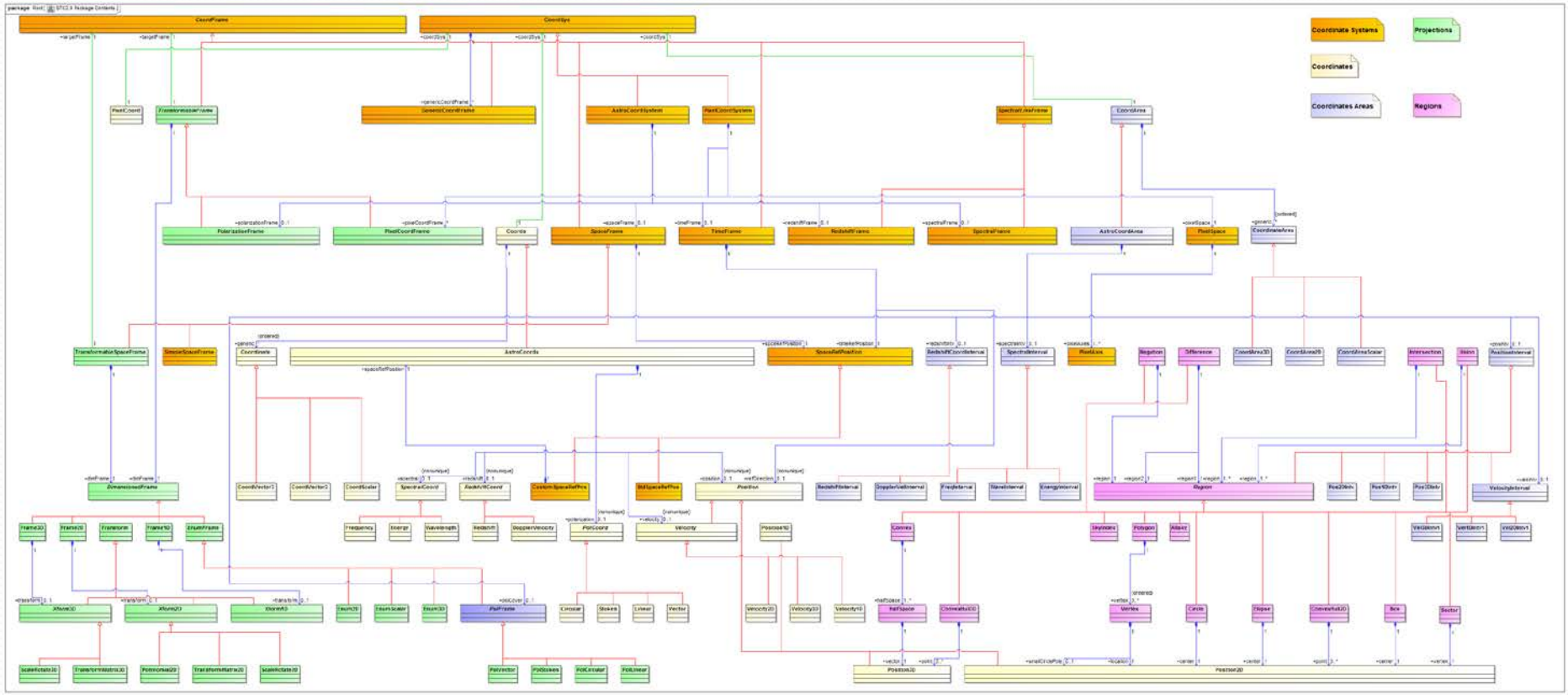
STC1 to STC2

- STC1 design dated – e.g., substitution groups
- Not used for its intended characterization purpose
- Lessons learned from the development and implementation
- STC2:
  - Use of VO-DML as a more robust design tool
  - Leaner and more abstract
  - More modular

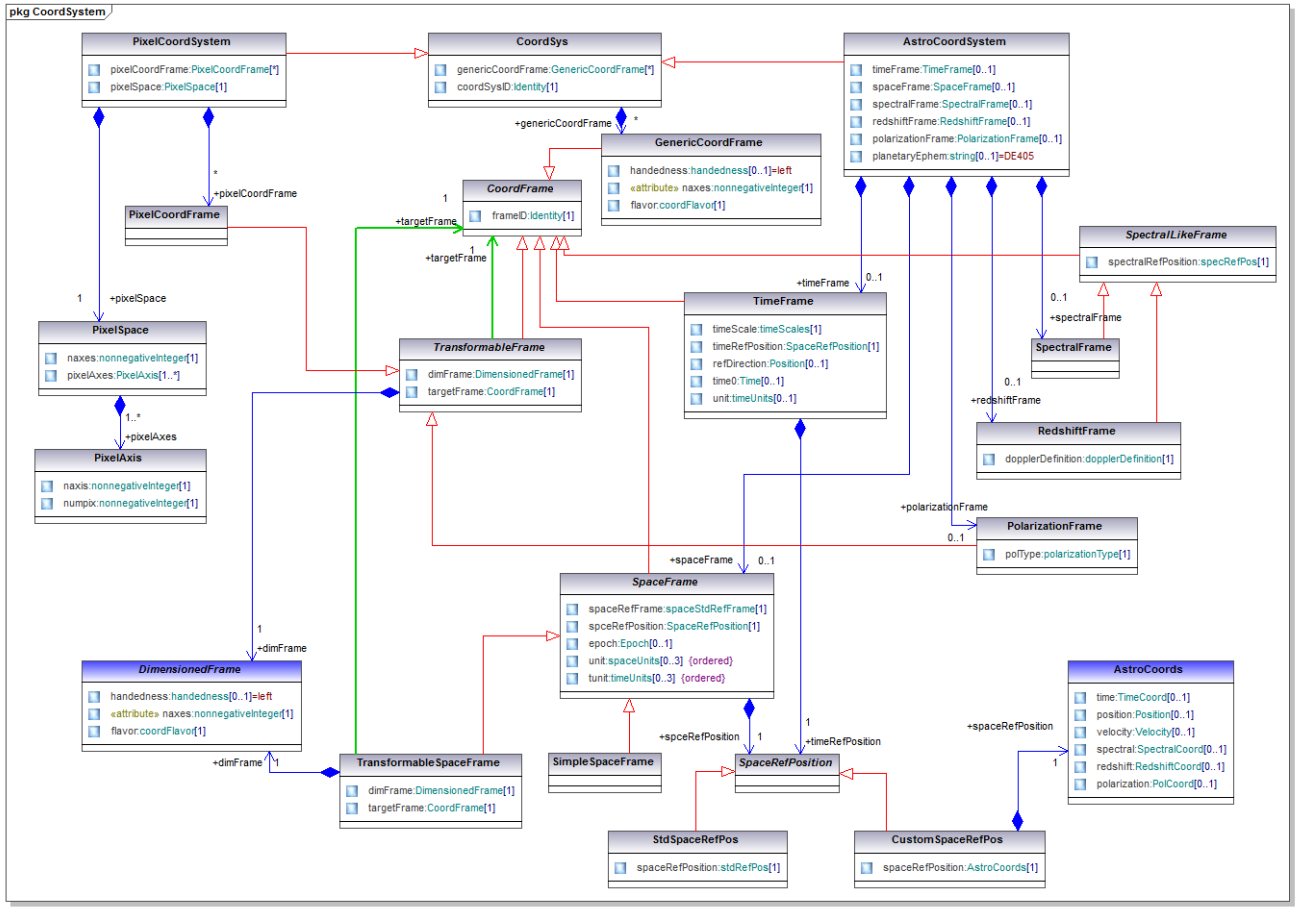
STC2 Modules

- Coordinate systems
  - Space and time
  - Spectral and redshift
  - Polarization
  - Enumerated coordinate axes
  - Pixel coordinates
- Projections
  - Modeling FITS WCS
- Coordinates in observation space
- Coordinate spaces
  - Regions

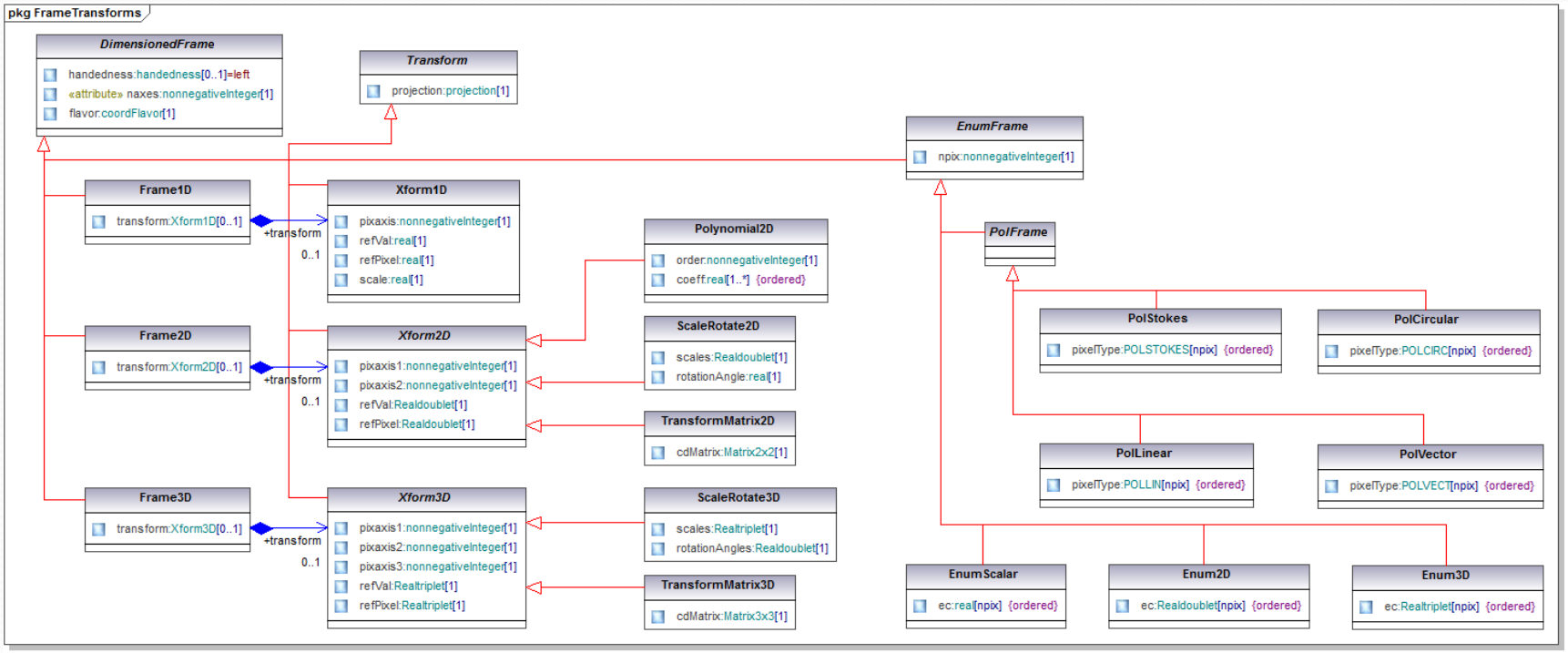
All of STC2 – First Draft



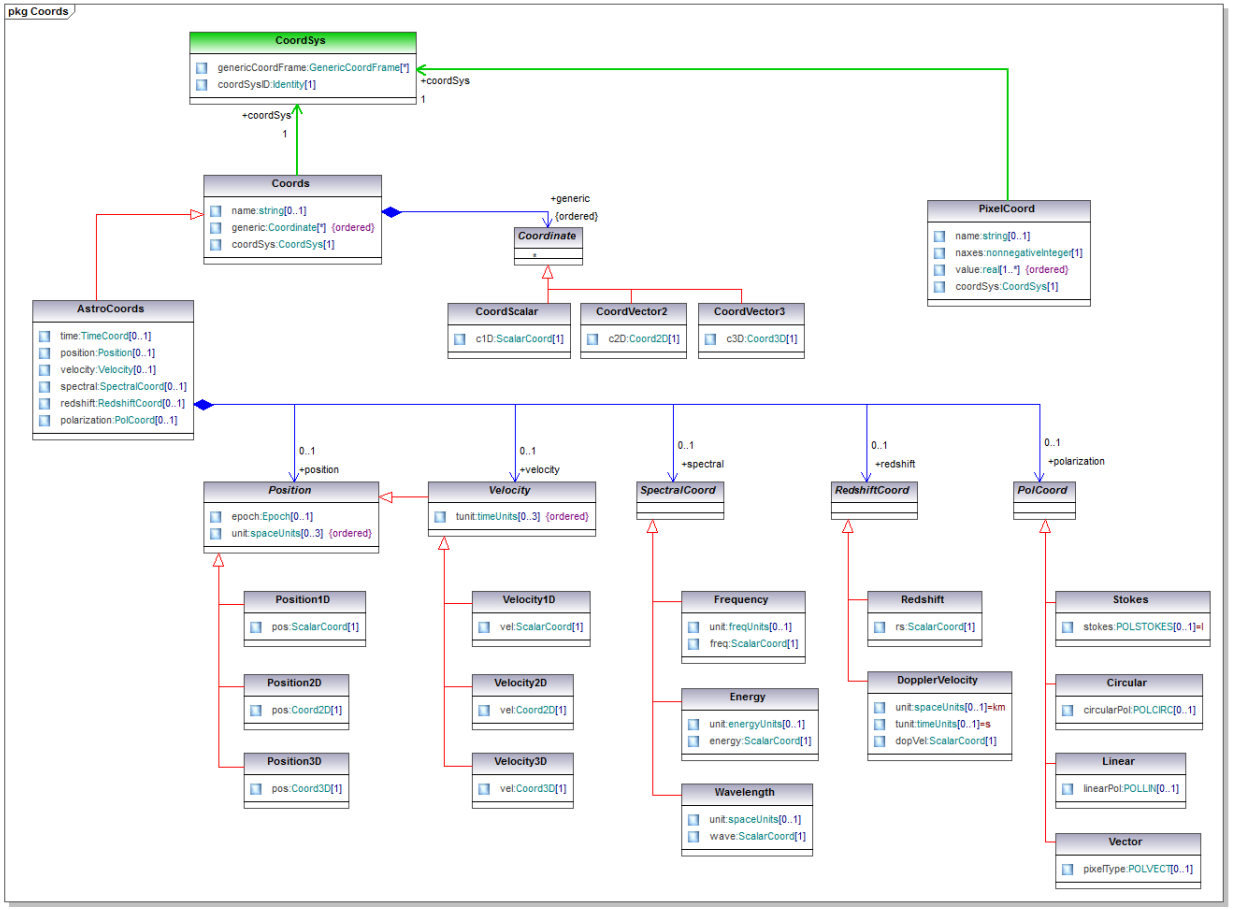
Coordinate Systems



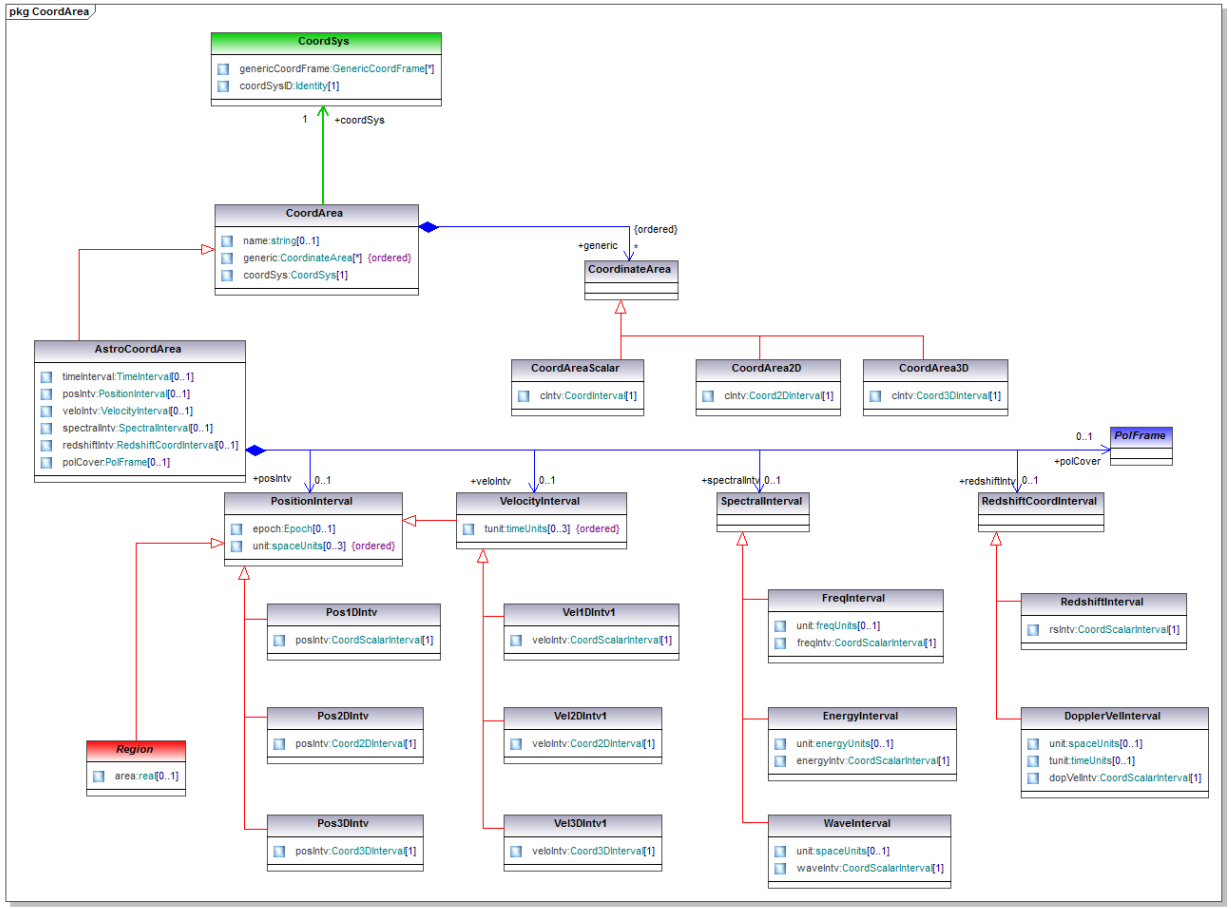
Projections (WCS, etc.)



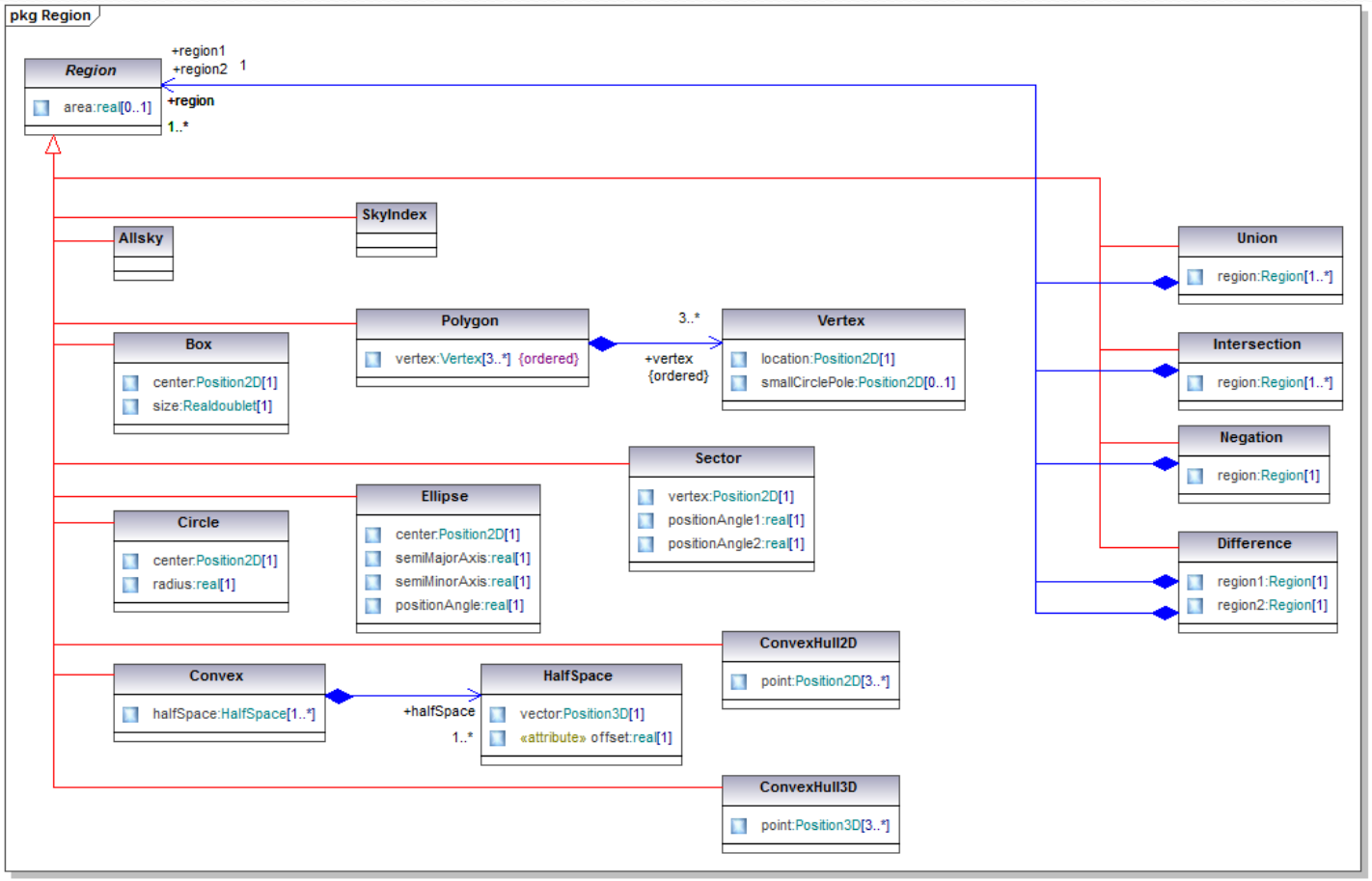
Coordinates



Coordinate Areas



Regions


pkg Region
Region
area:real[0..1]
+region1
+region2
1
+region
1..*
SkyIndex
Allsky
Union
region:Region[1..*]
Polygon
vertex:Vertex[3..*] {ordered}
3..*
+vertex
{ordered}
Vertex
location:Position2D[1]
smallCirclePole:Position2D[0..1]
Box
center:Position2D[1]
size:Realdoublet[1]
Intersection
region:Region[1..*]
Negation
region:Region[1]
Sector
vertex:Position2D[1]
positionAngle1:real[1]
positionAngle2:real[1]
Ellipse
center:Position2D[1]
semiMajorAxis:real[1]
semiMinorAxis:real[1]
positionAngle:real[1]
Circle
center:Position2D[1]
radius:real[1]
Difference
region1:Region[1]
region2:Region[1]
ConvexHull2D
point:Position2D[3..*]
Convex
halfSpace:HalfSpace[1..*]
+halfSpace
1..*
HalfSpace
vector:Position3D[1]
«attribute» offset:real[1]
ConvexHull3D
point:Position3D[3..*]

Requirements for Next Draft

- Fix the many places where Gerard's rules are violated
- Better modularization
- Higher level of abstraction (lose some detail)
- Listen to Markus and check against Mark's STCmod