

# Components

- A component is a datatype or a class
  - justified by a use case
  - conceptually in scope
  - with a machine-readable schema
- The values of a datatype or properties of a class need required ability to represent whatever it is that they communicate.
- There were originally twenty-five proposed components in four groups:
  - Core,
  - Time Coordinate,
  - Uncertainty,
  - Visual Positioning Support

# Review of Components by WP

- Before: Twenty-five proposed components in four groups. Review by looking a group diagram, then each component in sequence. Discussion embedded in process. About 1 minute of explanation per component.
- After: Twenty components:
  - Core – 4
  - Time Coordinate – 4
  - Uncertainty – 4
  - Visual Positioning Support - 8
- These are incorporated into the MSF Visual Positioning Prototypes and will provide some feedback on implementation and practicality in time for the October workshop.

# Core Components Before and After

Geodetic or geographic position defined by two angles and a height

**Position**

+number lat  
+number lon  
+number h

Orientation defined by the three vector and one scalar\ncomponents of a unit quaternion

**Quaternion**

+number x  
+number y  
+number z  
+number w

Orientation defined by three angles in degrees:\nyaw, pitch, and roll

**Angles**

+number yaw  
+number pitch  
+number roll

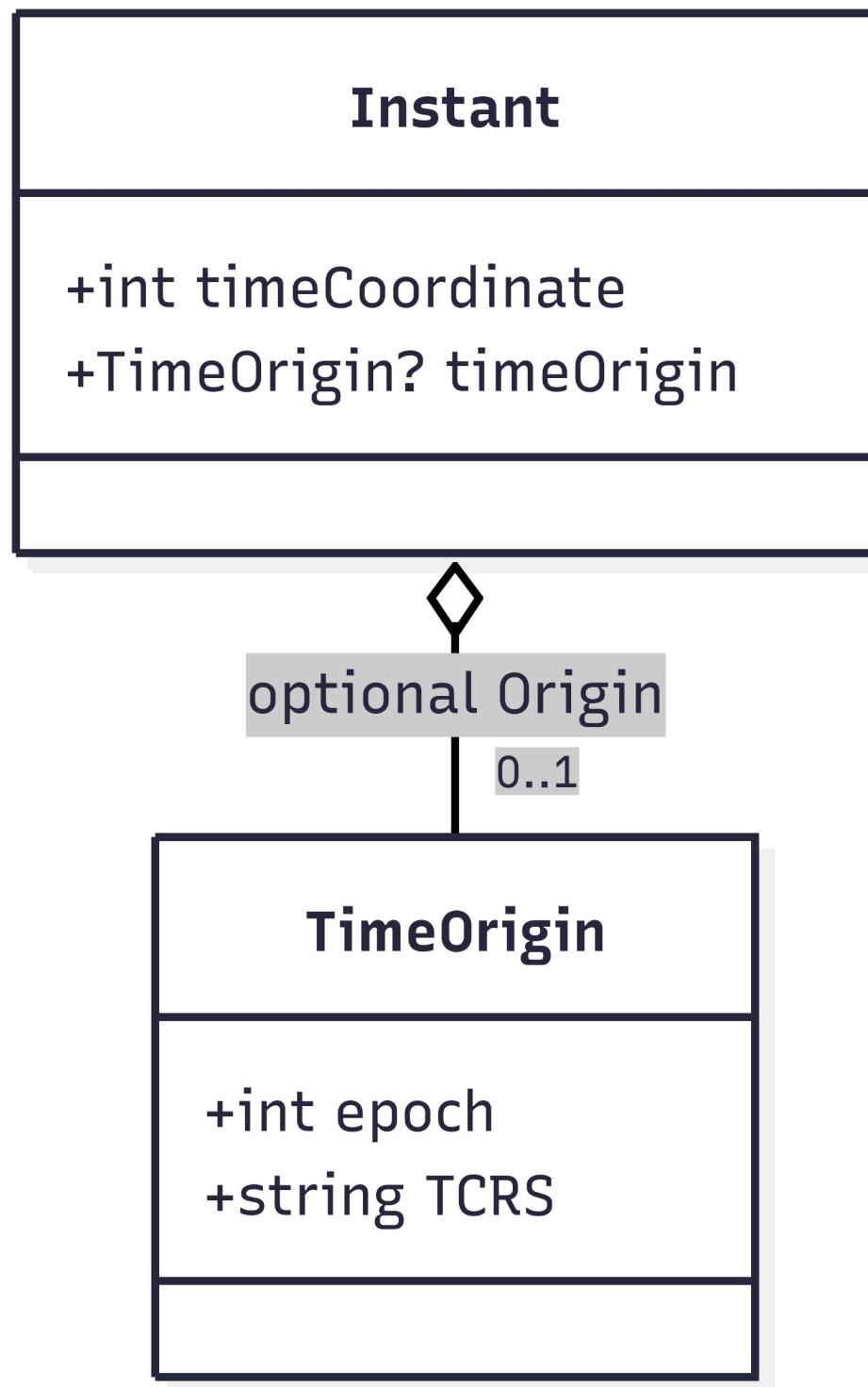
A variable length array of coordinate values

**Coordinates**

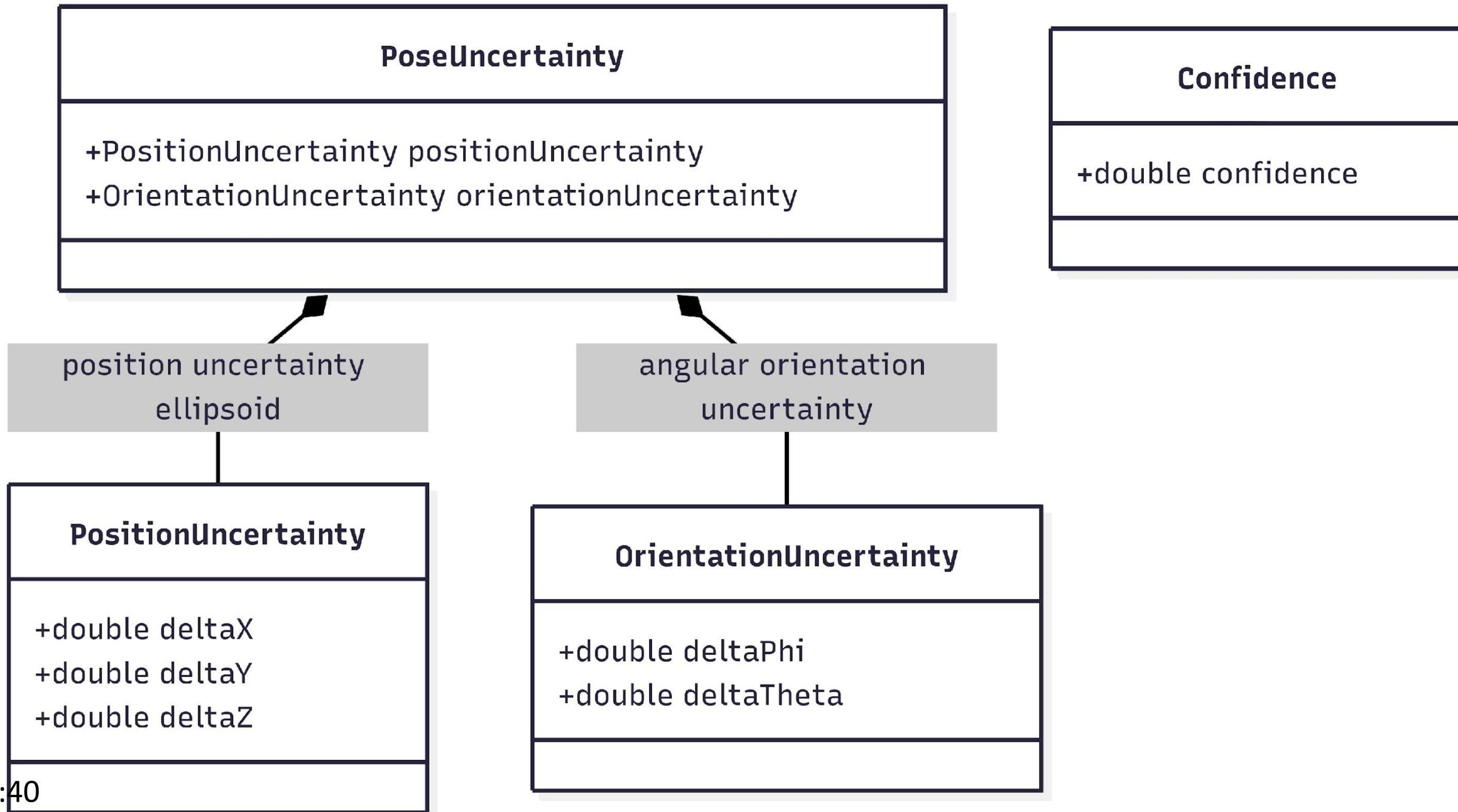
+number[] coordinates

2:20

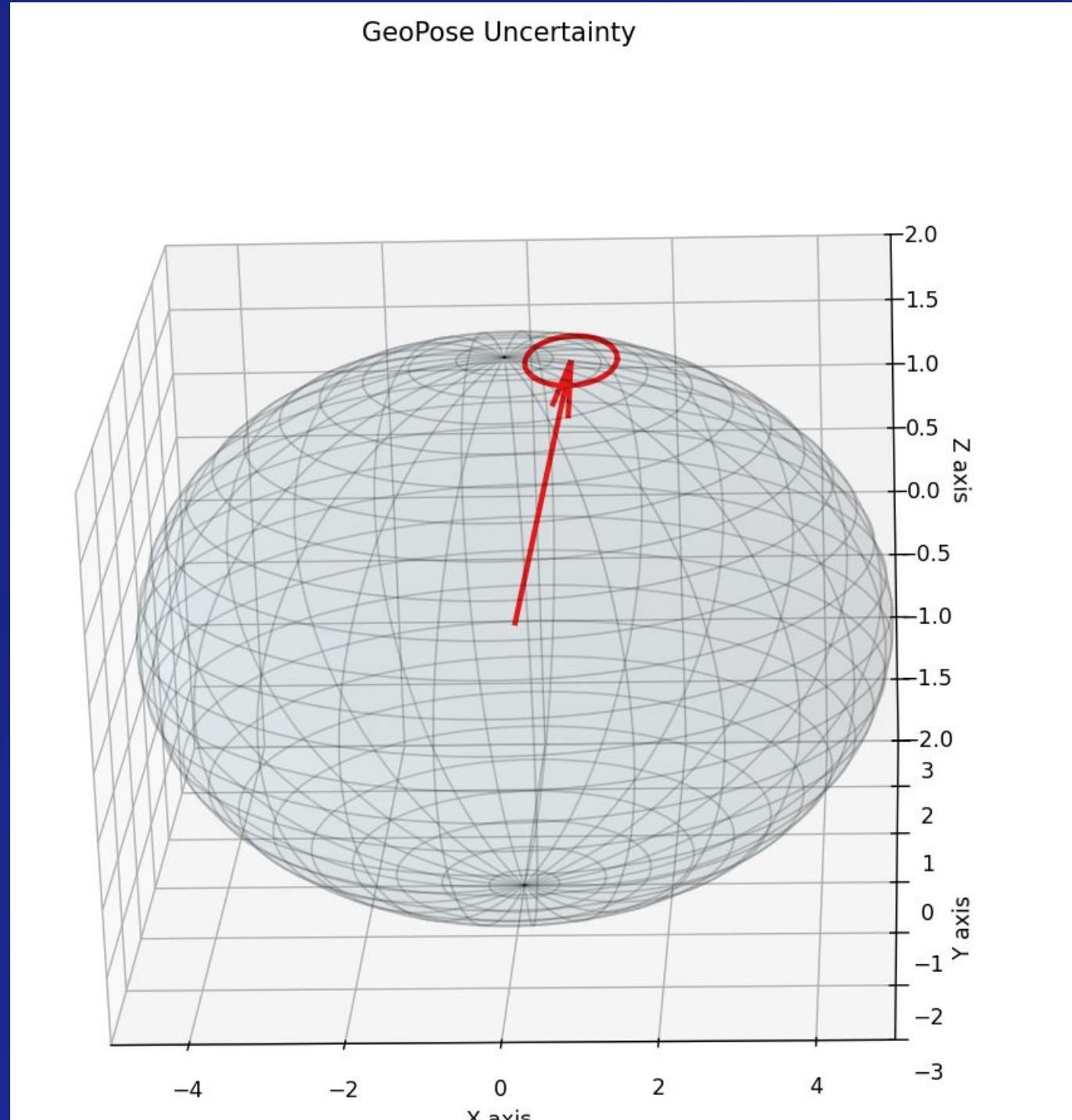
# Time Coordinate Components - After



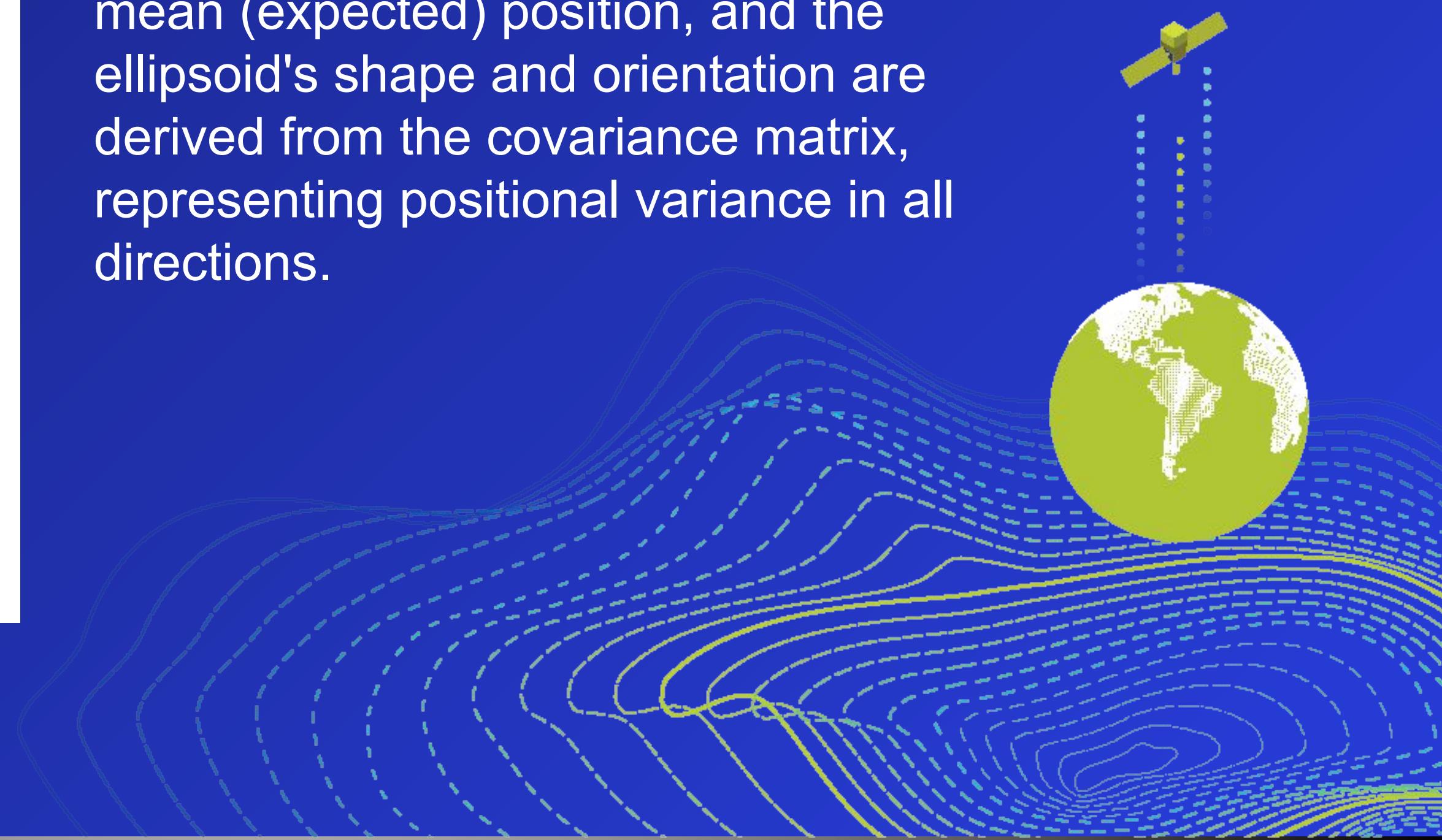
# Uncertainty Components - After



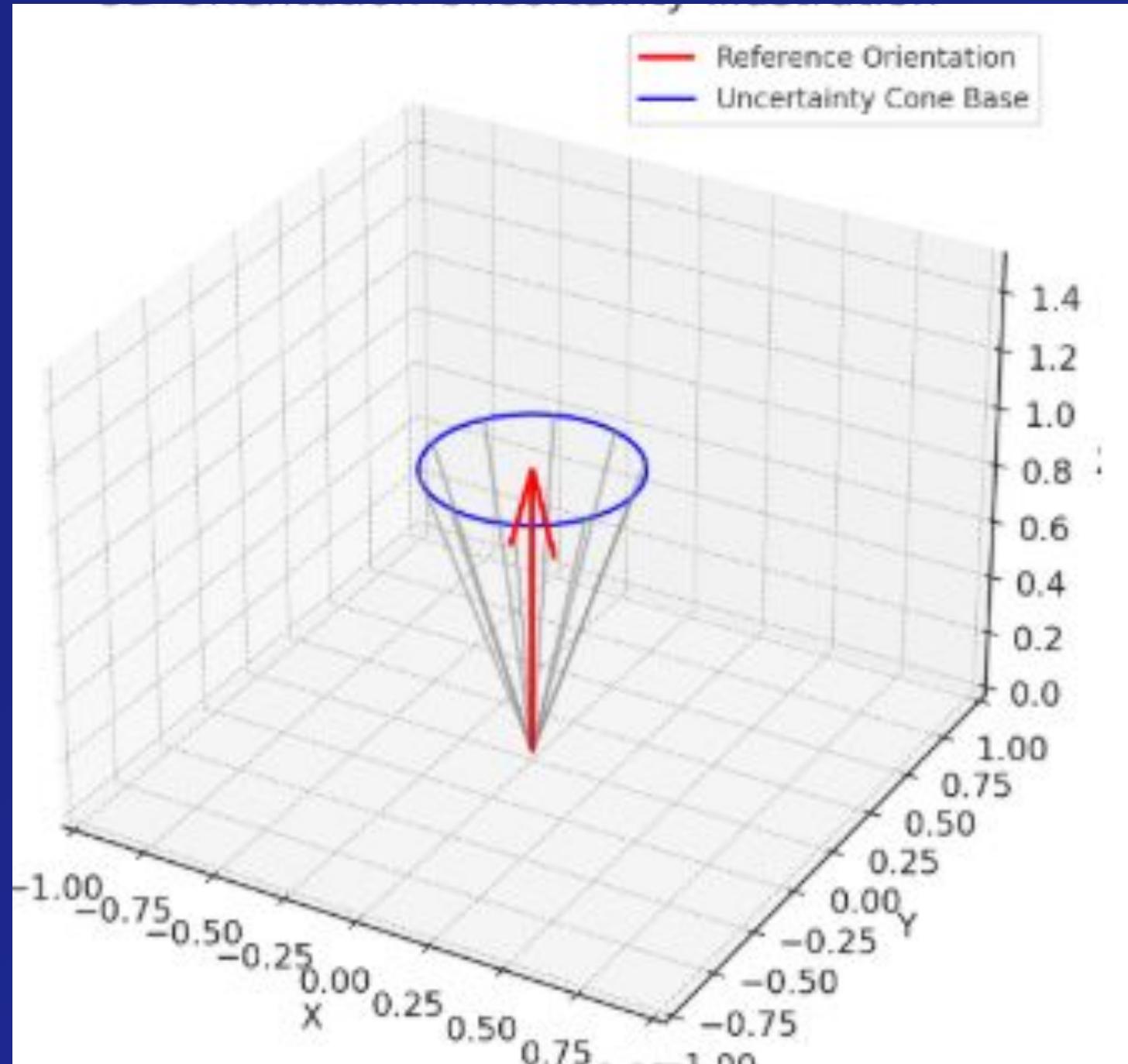
# Uncertainty Components – PositionUncertaintyEllipsoid



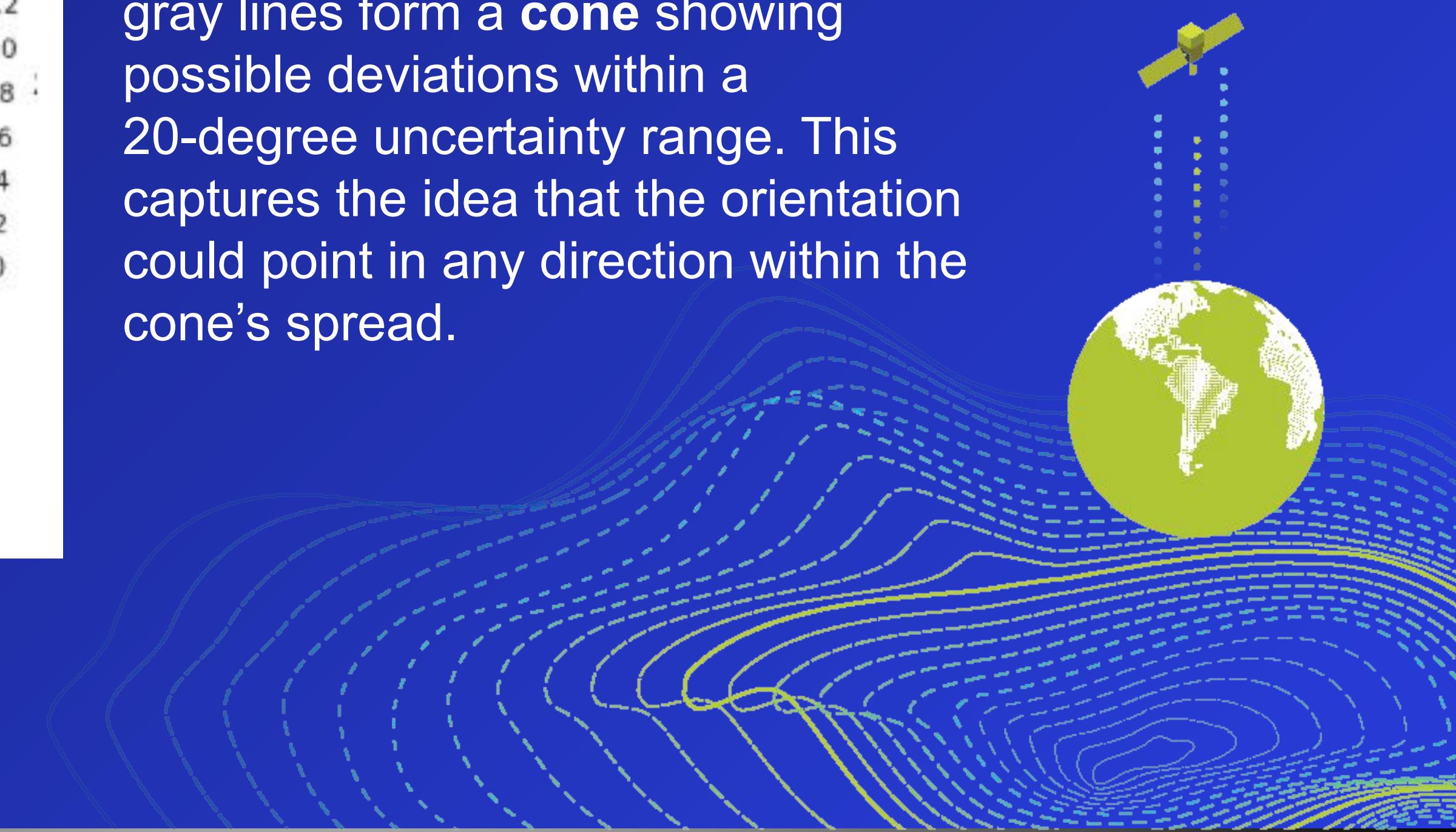
- A 3D position uncertainty ellipsoid, visualizes the spread and orientation of uncertainty around a central point in space. The red arrow indicates the mean (expected) position, and the ellipsoid's shape and orientation are derived from the covariance matrix, representing positional variance in all directions.

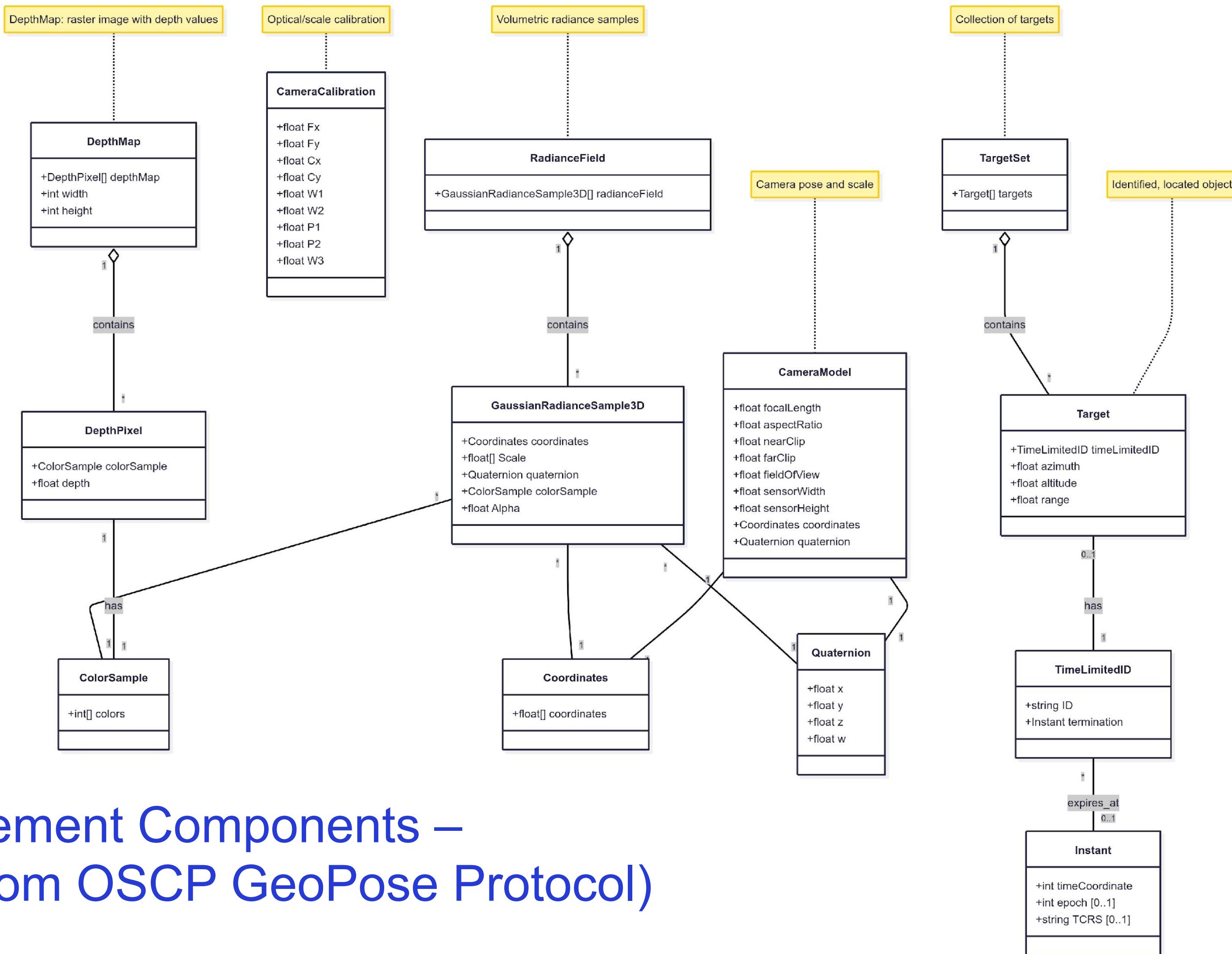


# Uncertainty Components – OrientationUncertaintyAngles



- Here is a 3D illustration of orientation uncertainty. The red arrow represents the **reference orientation**, and the blue circle and gray lines form a **cone** showing possible deviations within a 20-degree uncertainty range. This captures the idea that the orientation could point in any direction within the cone's spread.





# Image Element Components – (Mostly from OSCP GeoPose Protocol)

# GeoPose 1.X Status



- WP1 and 2 Decoupling of JSON Encoding and Conceptual Model

Definition of GeoPose Components and Componetized GeoPose

Developing 25-008 and 25-009 in repositories

What are “GeoPose Components?”

- WP 5 Time Coordinates (see next slide)

- WP 7 Uncertainty

See [Feb 20 proposal](#) especially slides 5, 6, and 7 with regard to some issues raised by Jim A.

Voice concerns/support as soon as possible

There was a meeting on this topic on Tuesday May 20

- WP 8 Support for MSF Real Virtual World Integration Prototype: RideHailing use case (using Hillyfields Data Bubble)

Please refer to MSF slides on [redacted] for details

Getting “deep images” from [OpenEXR](#)

Will work on this during next (2<sup>nd</sup> May) meeting

# WP 1 GeoPose Components & Componentized GeoPose



- Definition: units of description that are used to compose GeoPose and Standardization Targets
- <https://github.com/opengeospatial/GeoPose/issues/89>
- Covers all existing use cases
- Fully backward compatible
- See more in [these slides](#) for WP 1 and [these slides](#) for WP 2

*No Changes in over 60 days*

# GeoPose 1.1 JSON Encoding



- This will define JSON Encoding for all GeoPose components

*MIKEL, ROB SMITH, JIM*

# WP5: Time Questions -> See Proposal



- It would probably be a good idea to have a chat about how time integrates with the revised component structure. For example, time sequences may be superseded by the new component approach.

Time as just a coordinate axis, with temporal points in a 1-D sequence..

Issue: How do you specify which axis – temporal CRS? For example, TIA.

Issue: Axes with discontinuities or backwards jumps or stretching and squeezing are probably not good choices.

- On a related topic, are GeoPose components designed to be embedded in other formats or extended to encapsulate them, or both?

GeoPose objects are (unordered) compositions of GeoPose components

GeoPose components may be embedded in other formats, where they can be recognized and properly interpreted, using the component name (e.g. “quaternion”) as a key or unique identifier.

- We should agree what is in and out of scope for time support in GeoPose 1.x. **For instance, should we consider time interpolation - given the spline discussion last week?**

My opinion is that time interpolation is out of scope for time but nevertheless interesting and important for some use cases

- Do we have a list of identified use cases for timestamped GeoPose? For example, trajectories should probably already be on that list.

Any application where time is used for synchronization between independent platforms

Any application where travel time is a factor in interactions.

Navigation and motion capture would be two concrete ones.