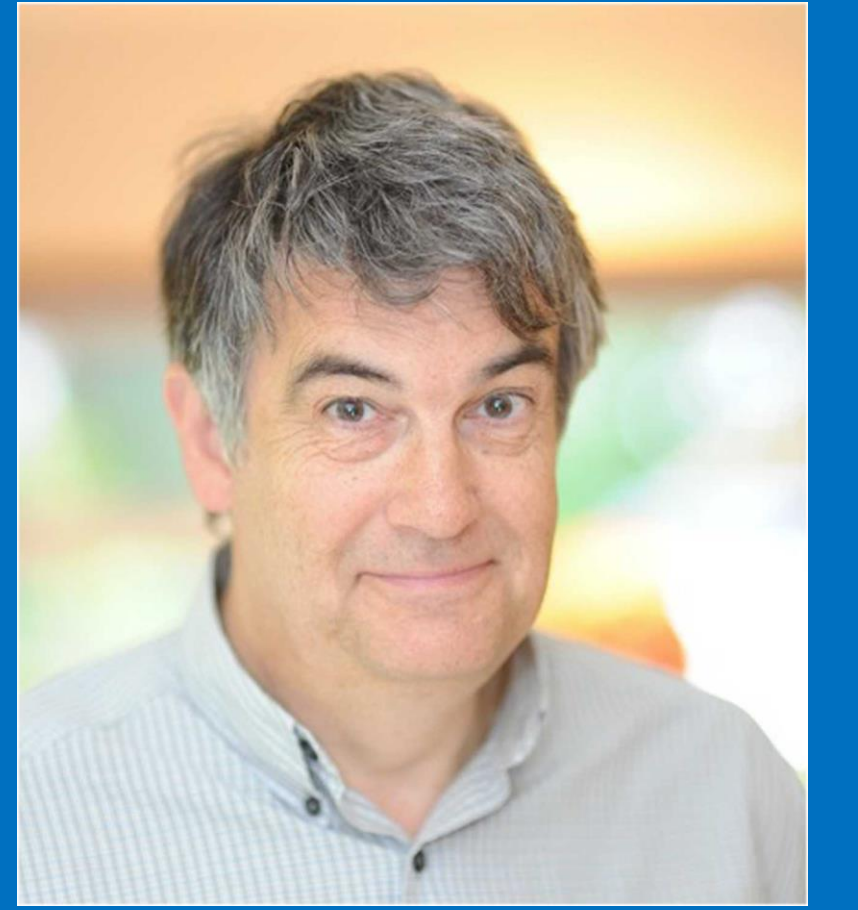




C11+ QHY174-GPS mpc Y98

Magnitude Calibration in TANGRA and Occult 4 – some Tips.

Tim Haymes (BAA and IOTA-ES)
tvh.observatory@btinternet.com



Working through some example light curves was found helpful.

Acknowledgments: D Herald (Occult4), H Pavlov (Tangra), O Schreurs (for helpful discussion)

Introduction: TANGRA magnitude Scale

There was a Review Question about the magnitude drop of (183) Istria on 2025-07-24.

We set up the magnitude scale to get a better idea of the drops.

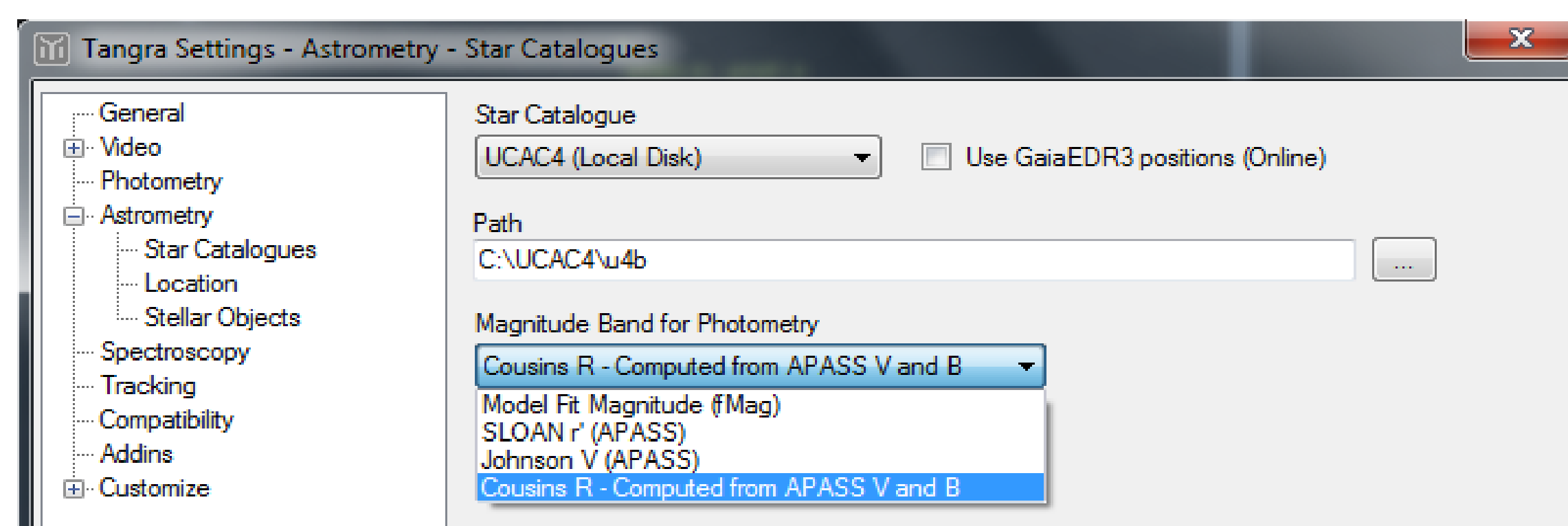
We first set the zero ADU level from the Customize menu.

The Magnitude option needs to be configured to replace ADU

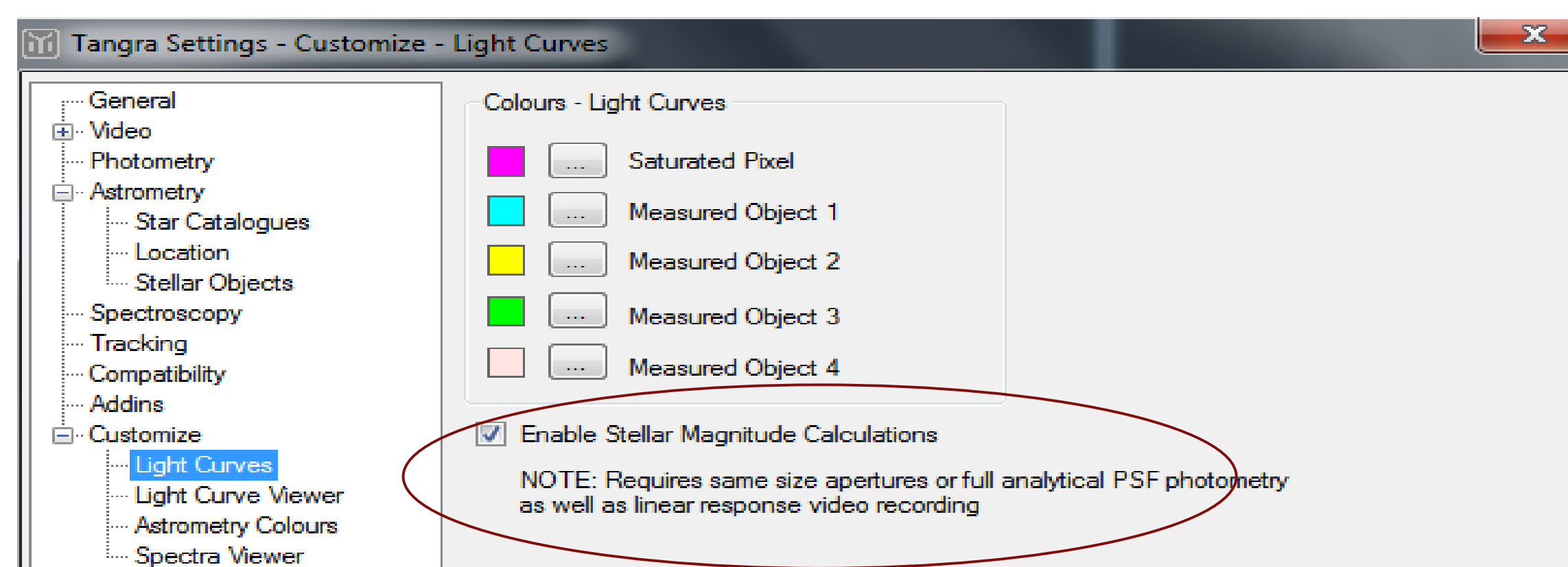


Configuring TANGRA to show magnitudes :-

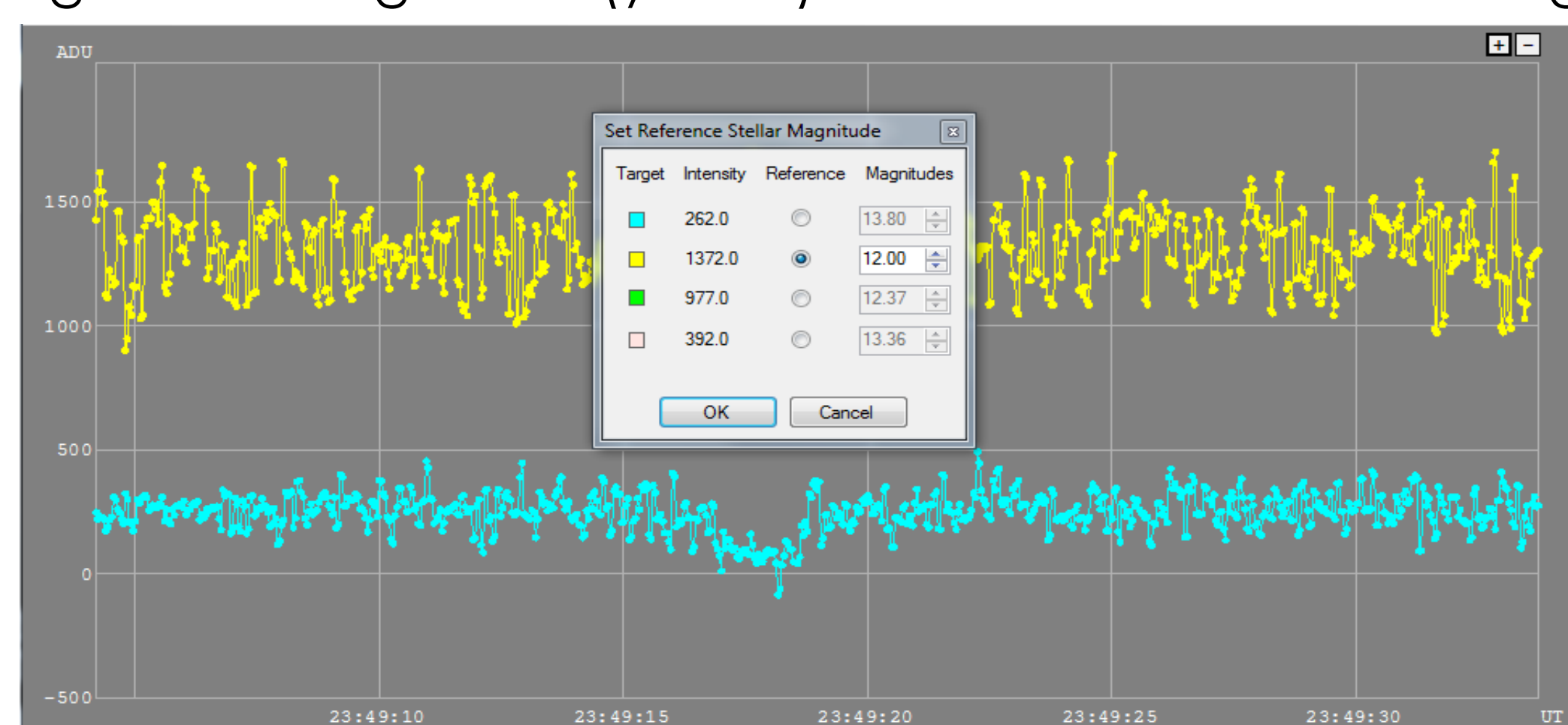
Settings>Astrometry>Star catalogue. I have used my local copy of UCAC4 and chosen Cousins R.



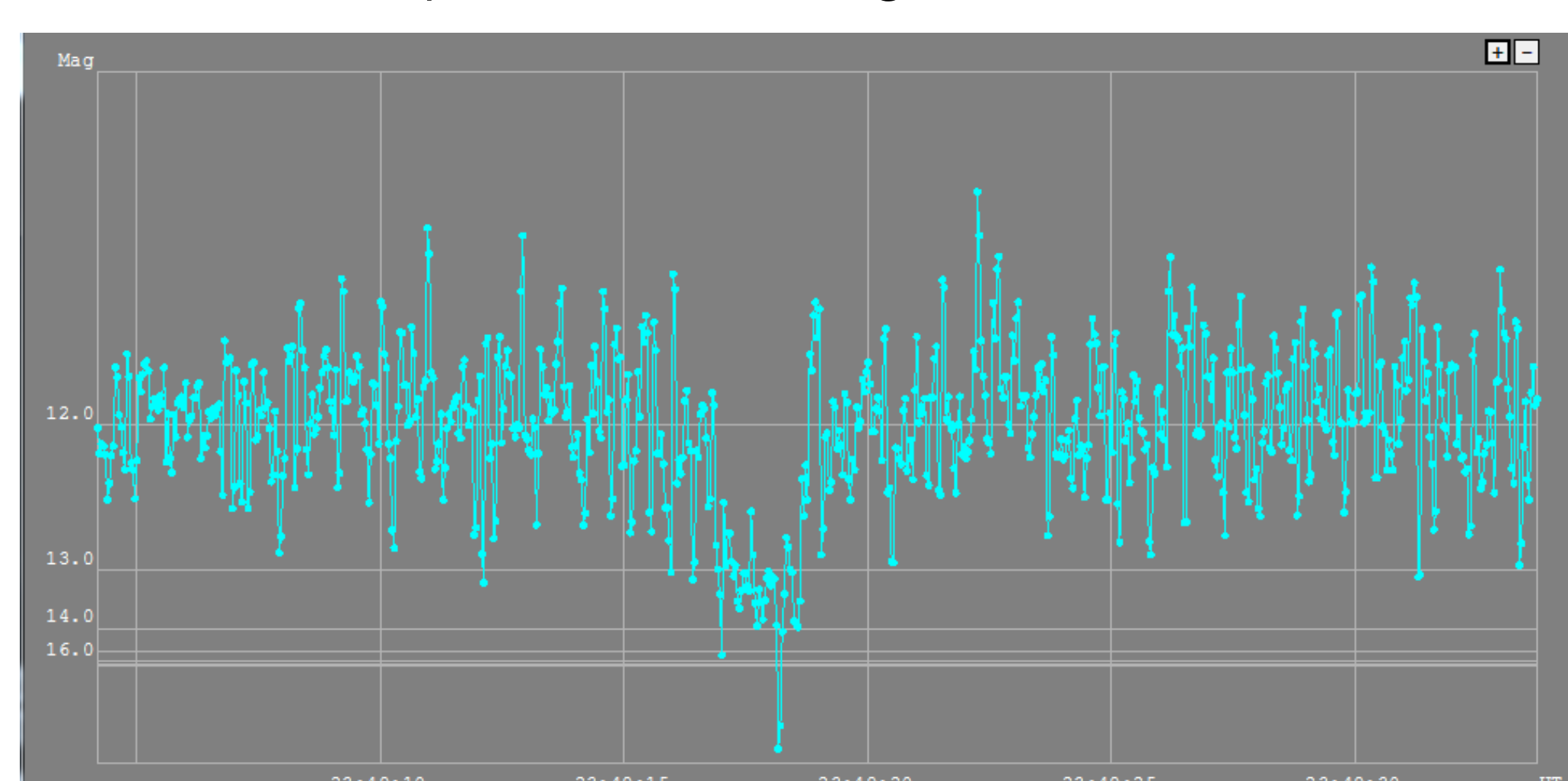
Settings>Customize> Light Curve: Enable Stellar Magnitude Calculations> [OK] SAVE



Show Magnitudes:- Set Reference Stellar Magnitude (blue) to combined magnitude. E.g.: given by Occult Watcher, OR use catalogue star magnitude (yellow). I used the combined mag.



Magnitude scale shown on Y-axis The magnitude drop is 1.3 in agreement with PyOTE. Residual light is from the Asteroid.

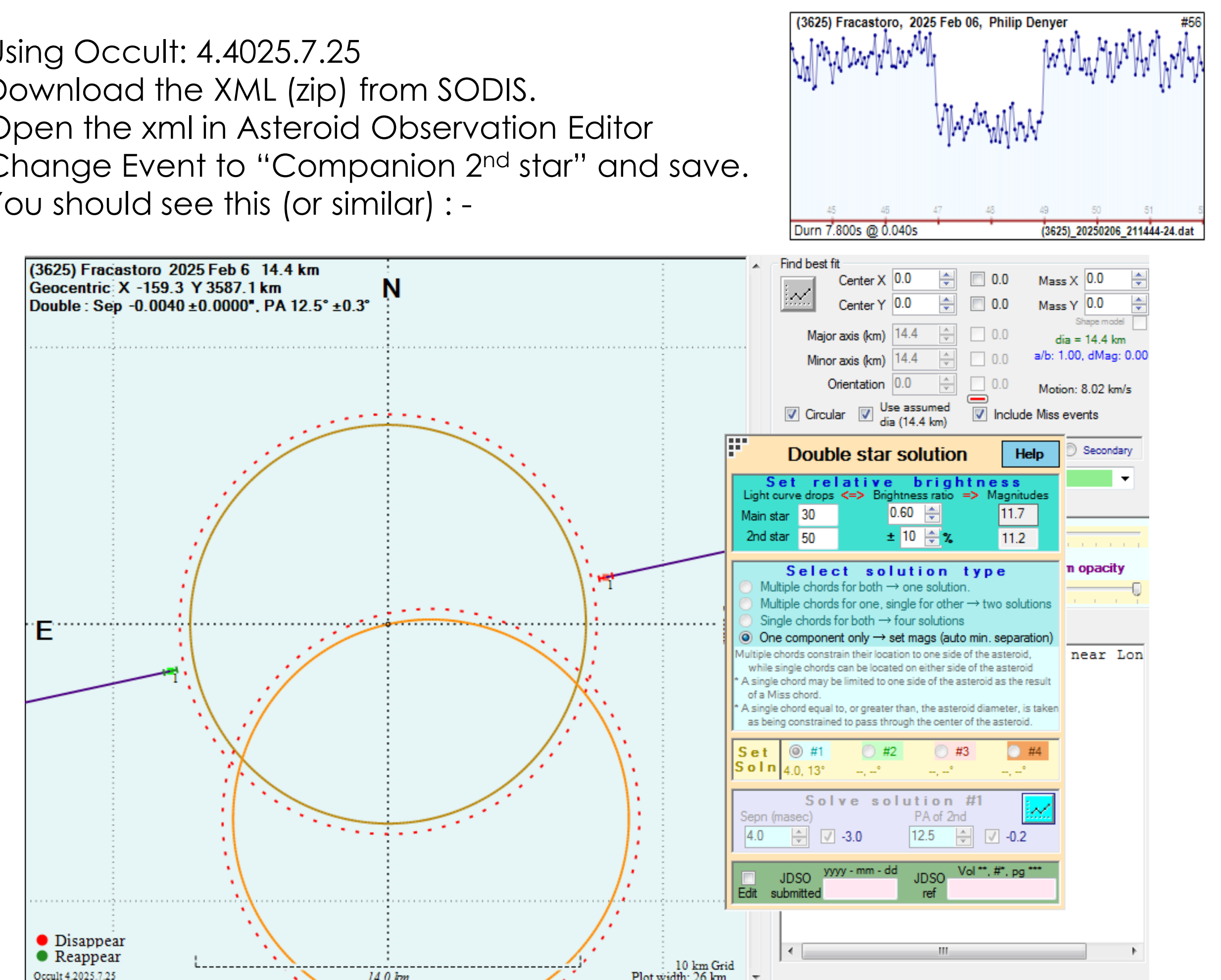


Introduction: Double Star from one component

Explanation from DaveH in email of 05/04/2025, 13:52Hr. Subject: NA Batch of 15 2024 #47

Example: (3625) Fracastoro on 2025-02-06 observed by P Denyer (GB).

- Using Occult: 4.4025.7.25
- Download the XML (zip) from SODIS.
- Open the xml in Asteroid Observation Editor
- Change Event to "Companion 2nd star" and save.
- You should see this (or similar) :-



- From the zipped export file, put the light curve (.dat) in the folder... Occult4>LightCurveReports.
- View the file from Occult Light Curve Viewer and measure the light drops or use a ruler on the screen. **Follow this Occult Help File** advice:-

- Measure the light drop of the occulted star - and enter that for the Main star
- Measure the light drop from the bottom of the light curve drop to the expected drop level for the occultation. Enter that as the 2nd star (Occult Help)

In practice when Dave Herald solved this, the values 50 and 30 were used.

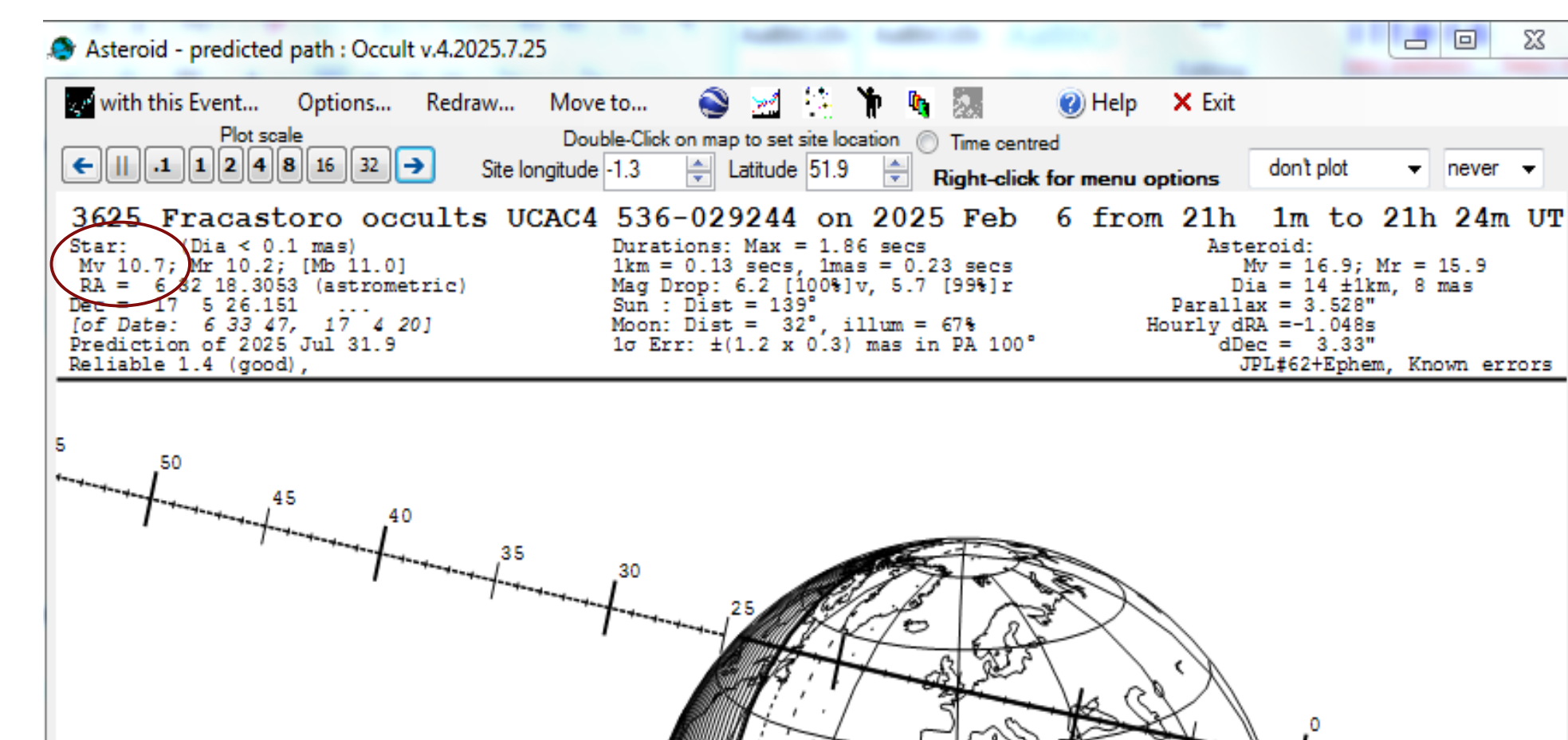


DS Solution: 11.7, 11.2 at PA 13, minimum separation 4.0 mas

Note: The text on the PLOT at top left, automatically gives the minimum separation (mas) and position angle (..without any user input...). This is based on the assumed diameter (14.4km) and the direction of motion. Only the relative brightness are needed to estimate magnitudes. These solutions could be added to SODIS observation comments (not obligatory) if there is good evidence for a double star. Read the Occult HELP topic.

How are the magnitudes calculated ?

Occult has information on the star and asteroid, AND therefore the total magnitude.



Using mag 11.7 and 11.2 gives combined v10.7, which is correct QED