UFO Analyser - Leeds

Overview

Processes video clips recorded by *UFO Capture*

Profile – stellar scintillation masks against SKY 2000 catalogue

Derives meteor charcteristics:

- Apparent magnitude
- Duration
- Start and end points of trail
- Angular velocity
- Shower membership (provisional)
- Distance from catalogue radiant
- Orbital velocity

Creates M?.csv file for use in *UFO Orbit*

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Stellar registration profile

Registers the video stellar scintillation masks with SKY 2000

Unique to each camera / lens combination

Must be recreated if:

- Either is moved or changed
- Brightness / contrast are changed

Analyser can compensate for small displacements:

- Flexure of camera / lens / mounting
- Subsidence
- Change of focus

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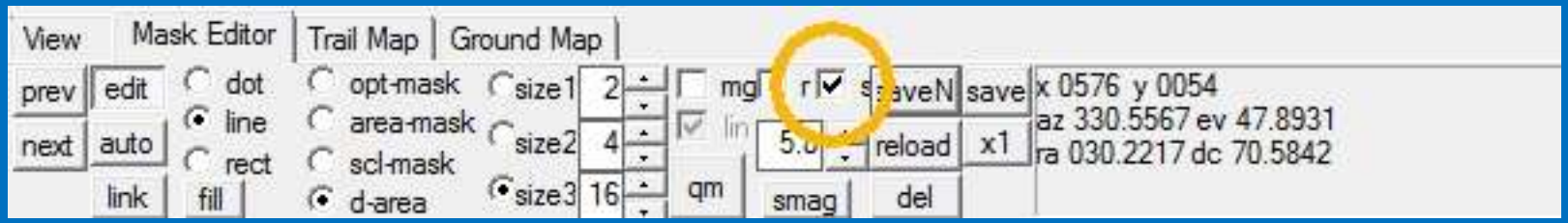
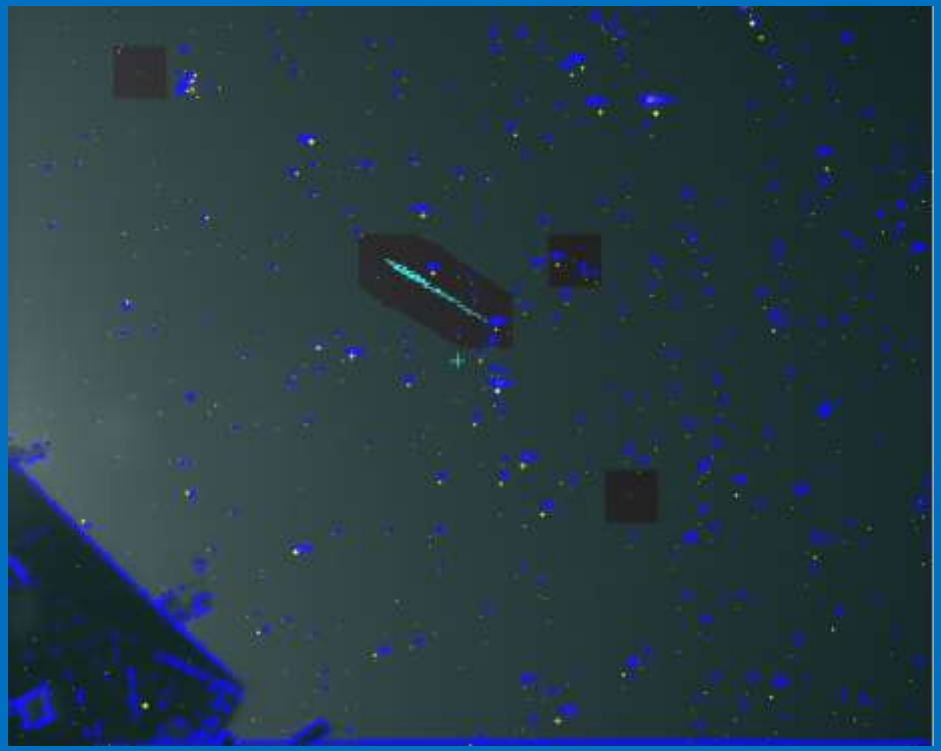
Stellar registration profile

Profile check





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Stellar registration profile

For each batch of video clips

Use a master profile

Read in the clips

Mask Editor – link – auto link – adj pos all

Click <SD to remove poor links until dpix avr <= 0.3

Tick ‘mg’ box to review magnitude fit

Rerun adj pos all

If necessary, click <SD

Click ‘mag’ to compute the linear fit

Re-read the clips

Run analyze all

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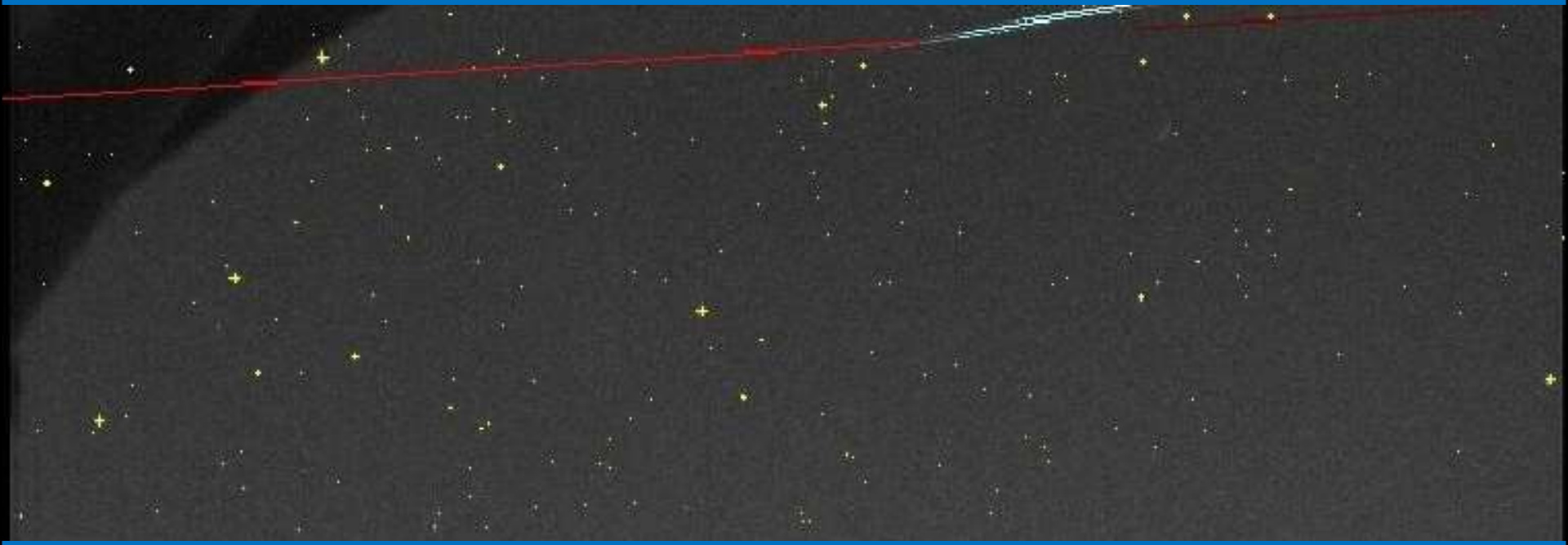
Checking trail alignment

Do an *Analyze All* pass as a first run through
Analyser isn't perfect, so do a manual check of each capture



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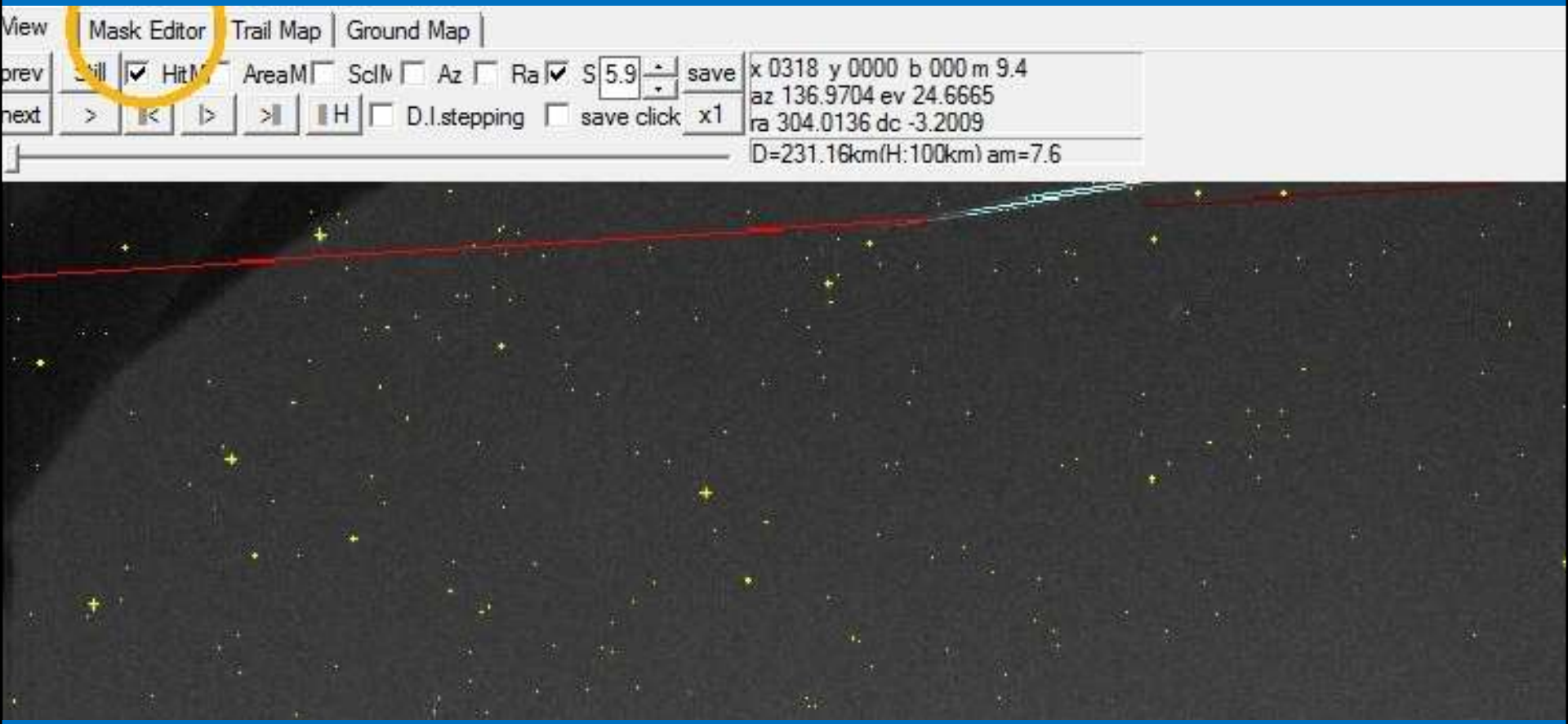
Checking trail alignment

Use Mask Editor to correct the alignment



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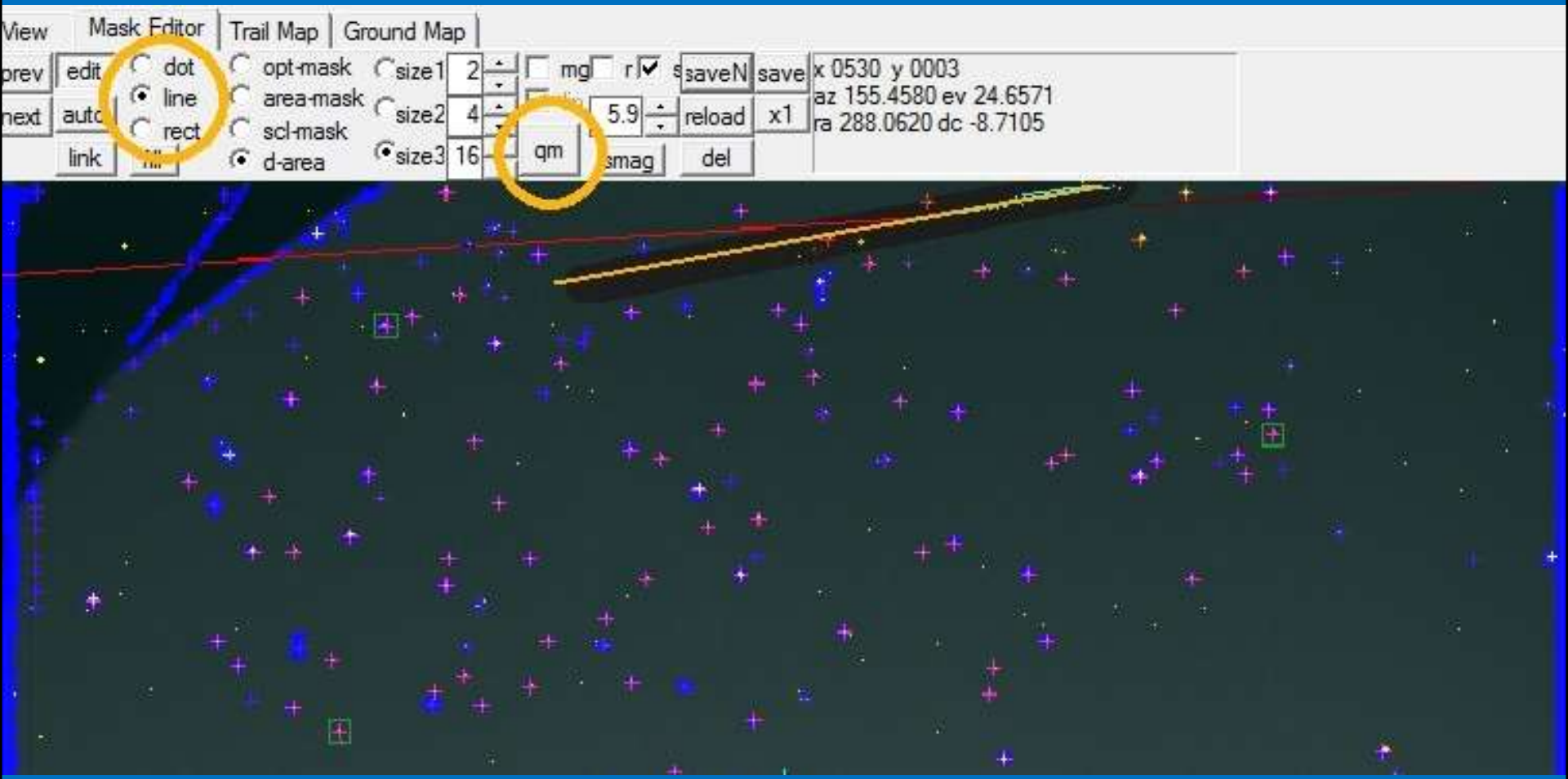
Checking trail alignment

Use Mask Editor - ‘qm’ (Quick Mask) and ‘line’ option
Click on ‘A’ to re-analyse the clip



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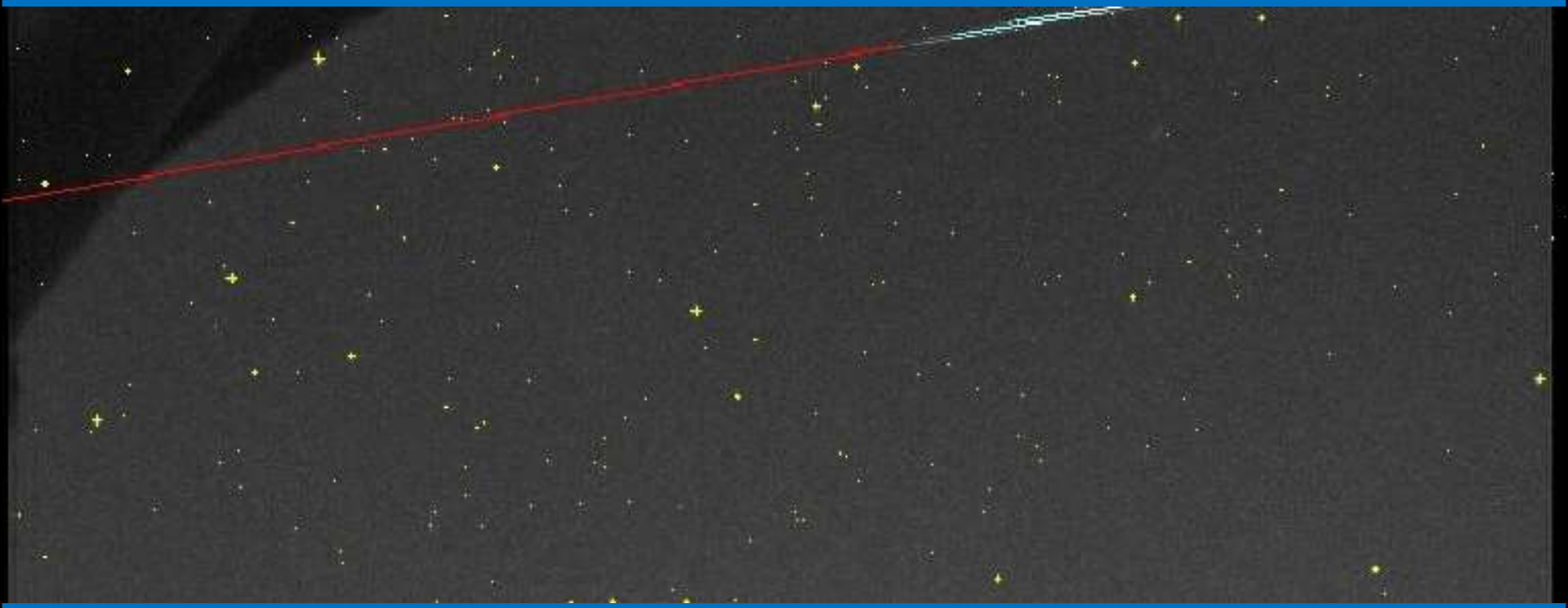
Checking trail alignment

The corrected alignment looks much improved



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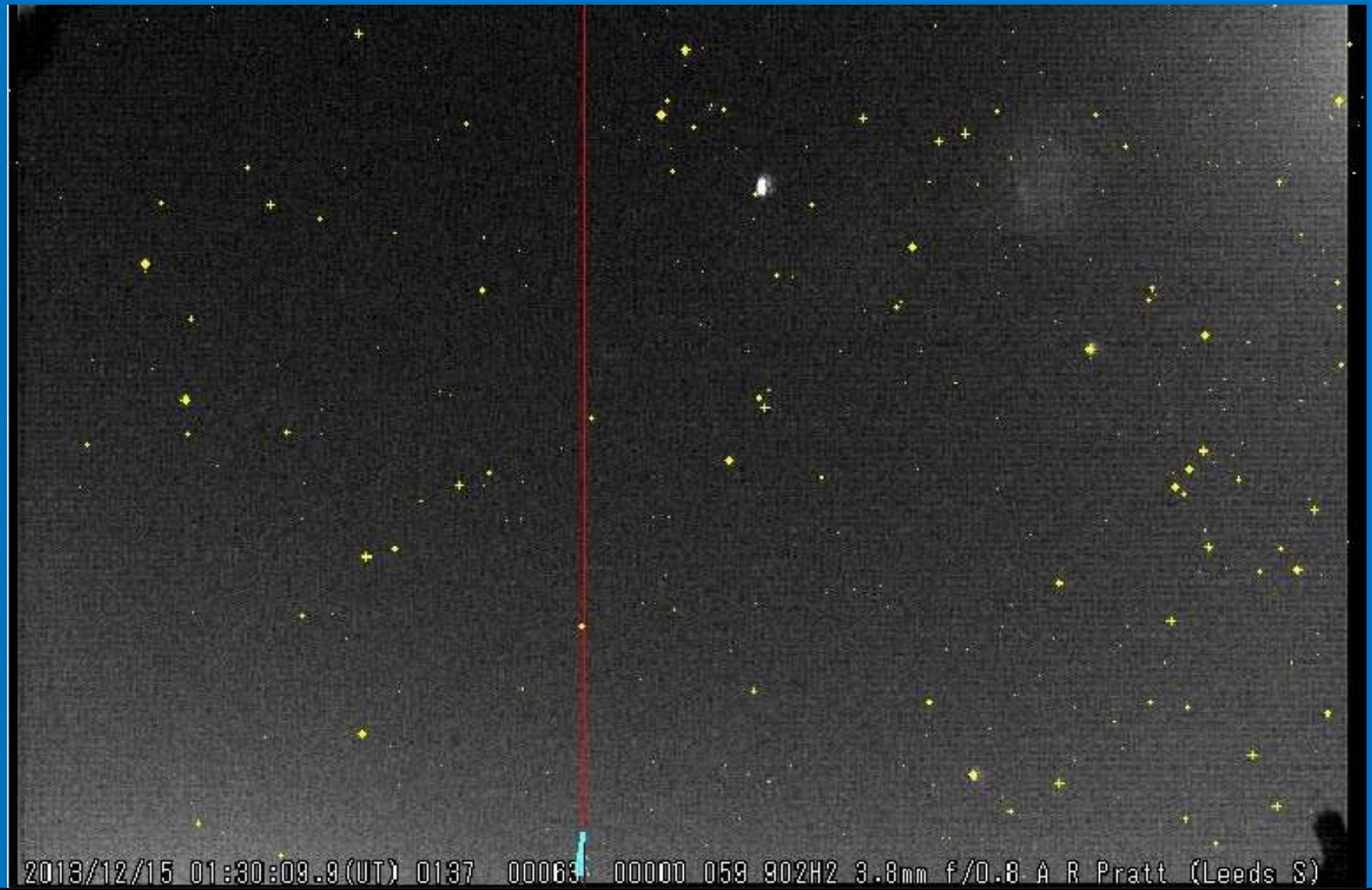
Slight misalignment



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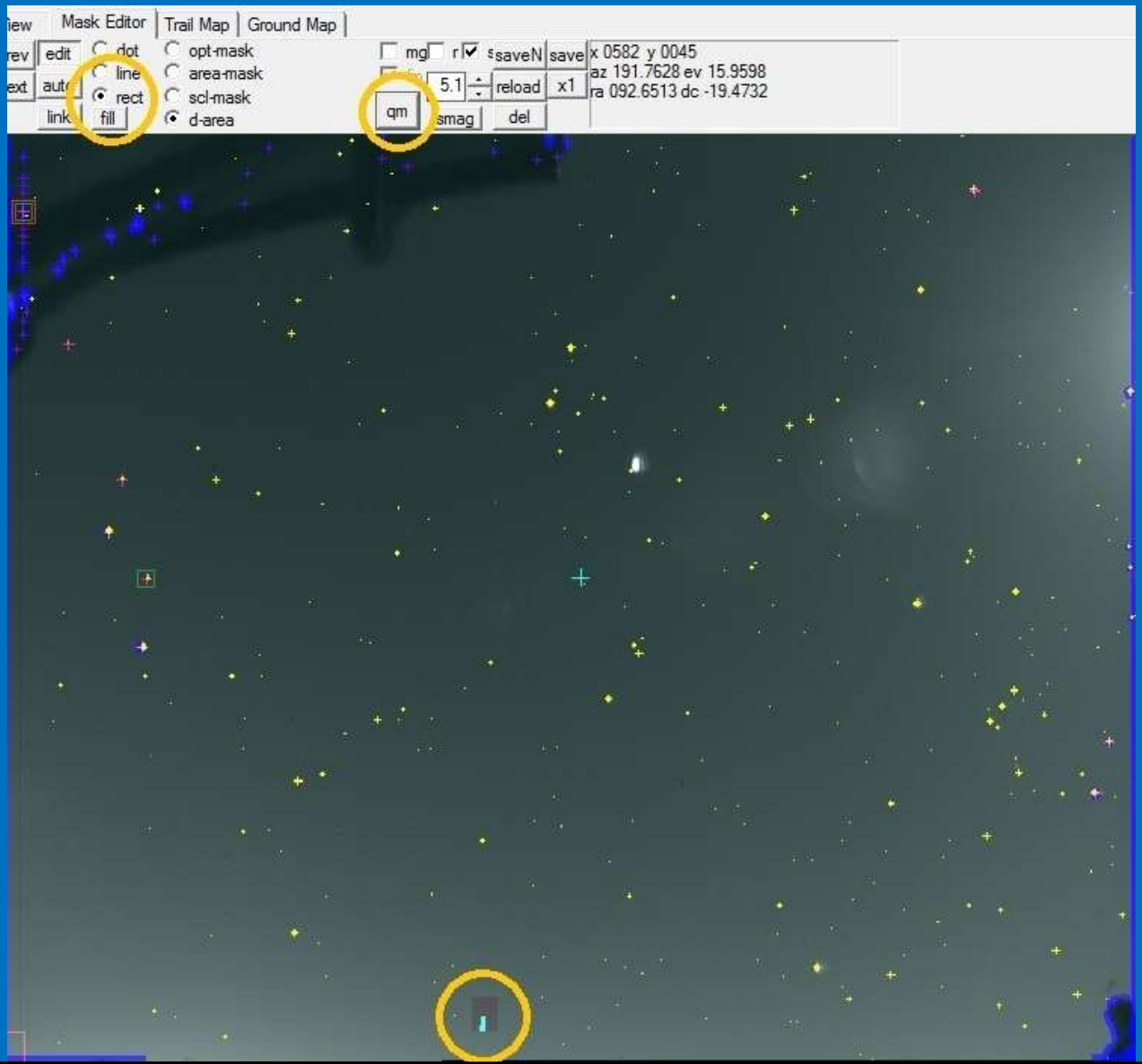
Mask Editor – ‘rect’ mask



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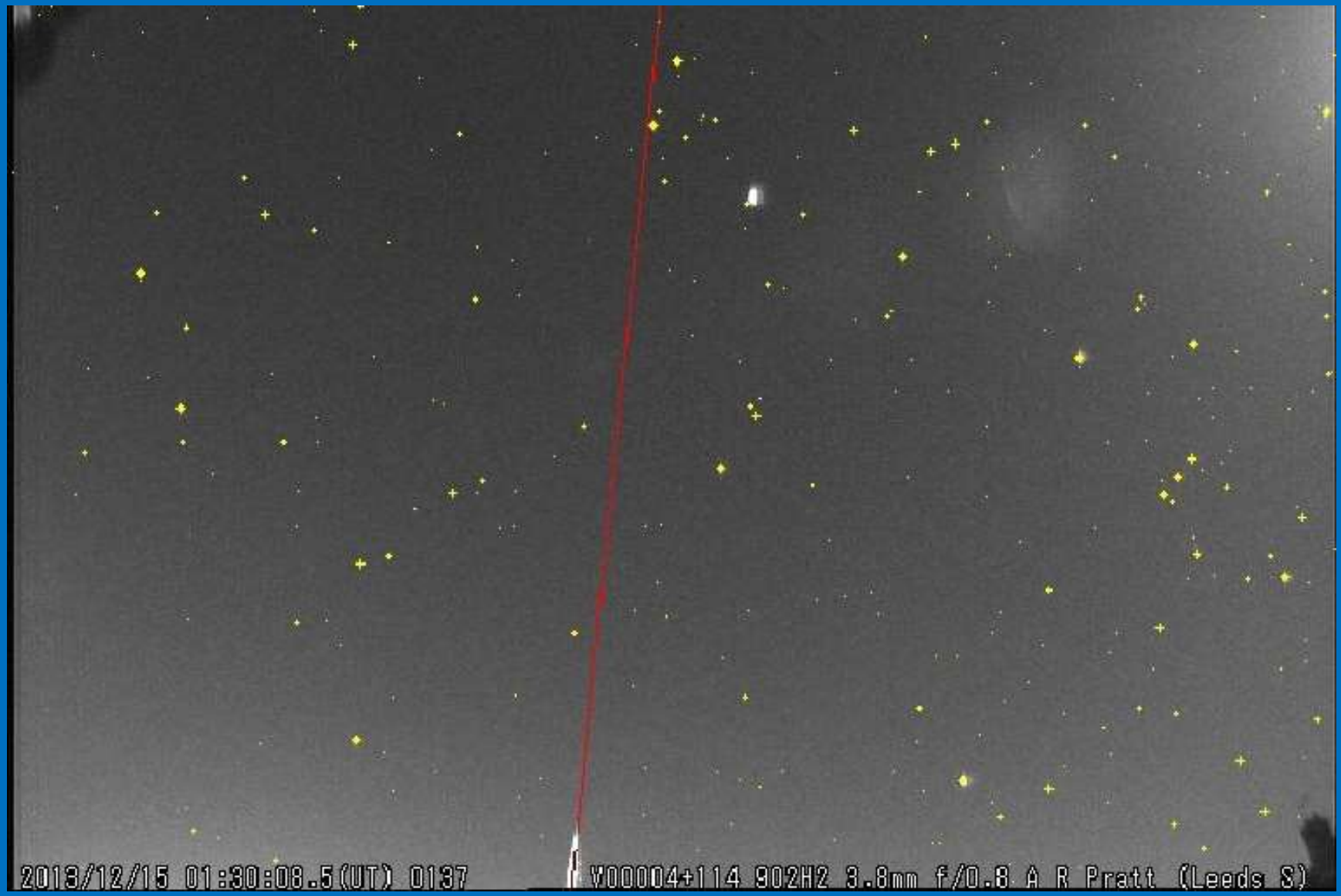
Alignment corrected



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‘ddl’ and ‘leap’

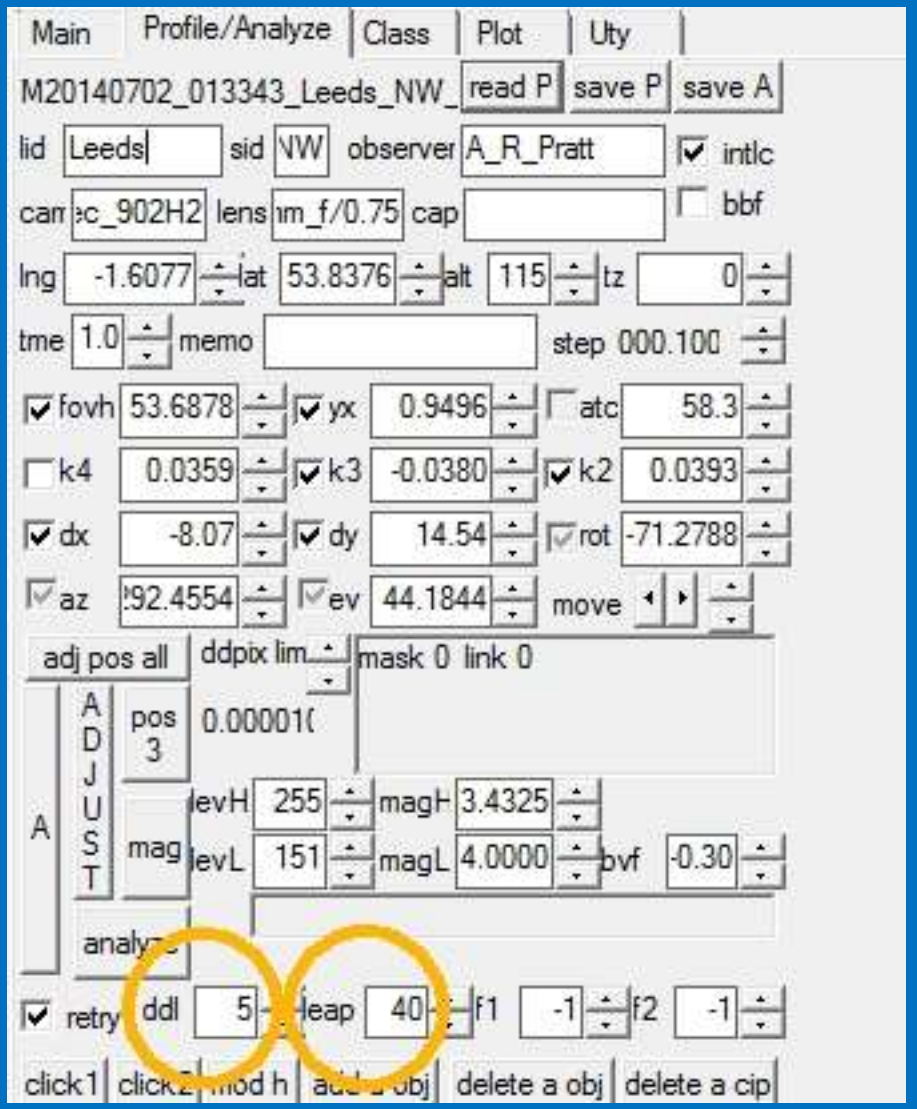
Parameters in the Profile / Analyze tab

Affect the detection thresholds

If object is ‘none’, ‘noise’ or ‘slow’ – reduce ‘ddl’

If object is ‘curve’ or ‘flash’ – Increase ‘ddl’

Increase / decrease ‘leap’ to process multiple objects



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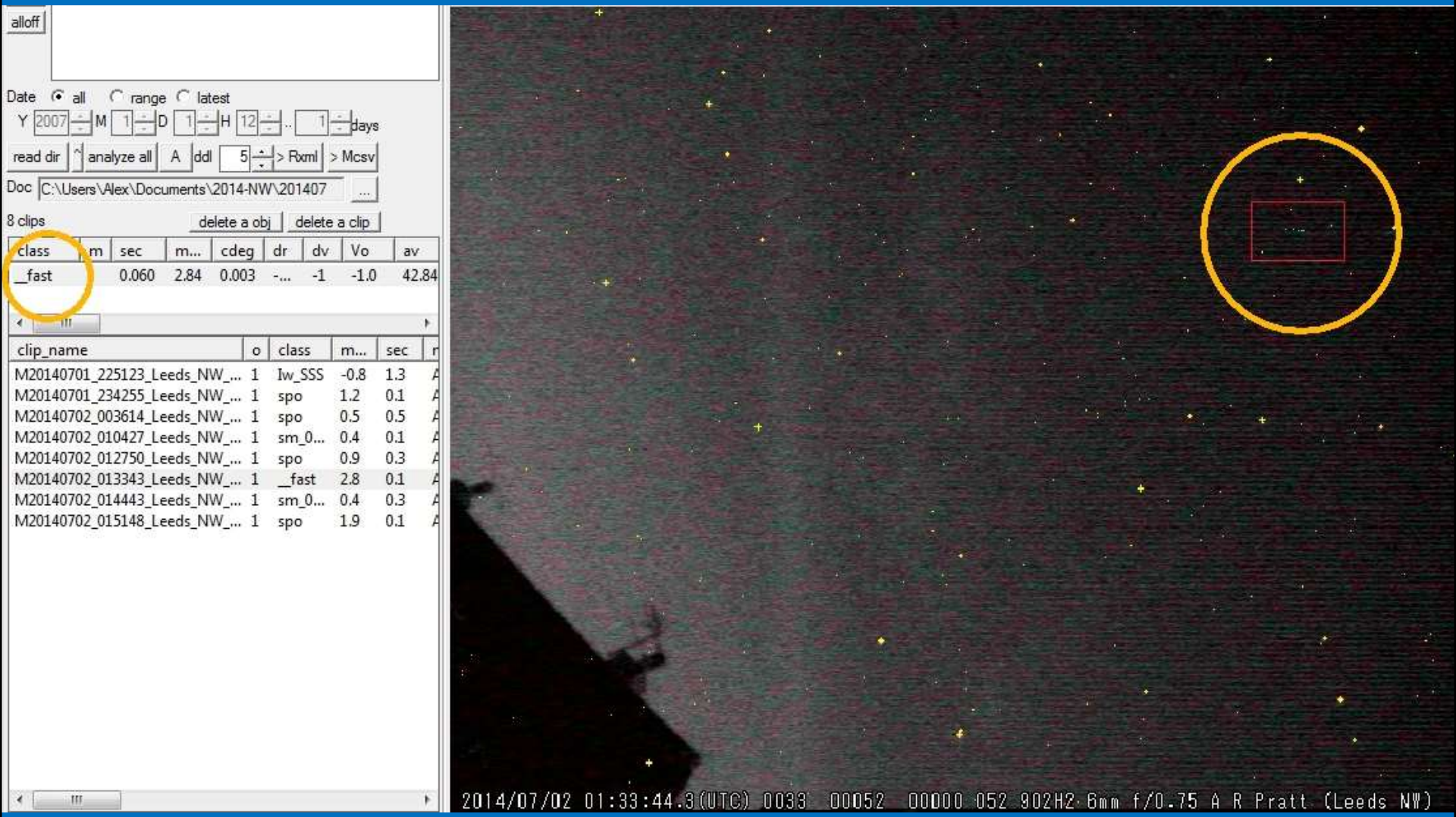
‘ddl’ and ‘leap’



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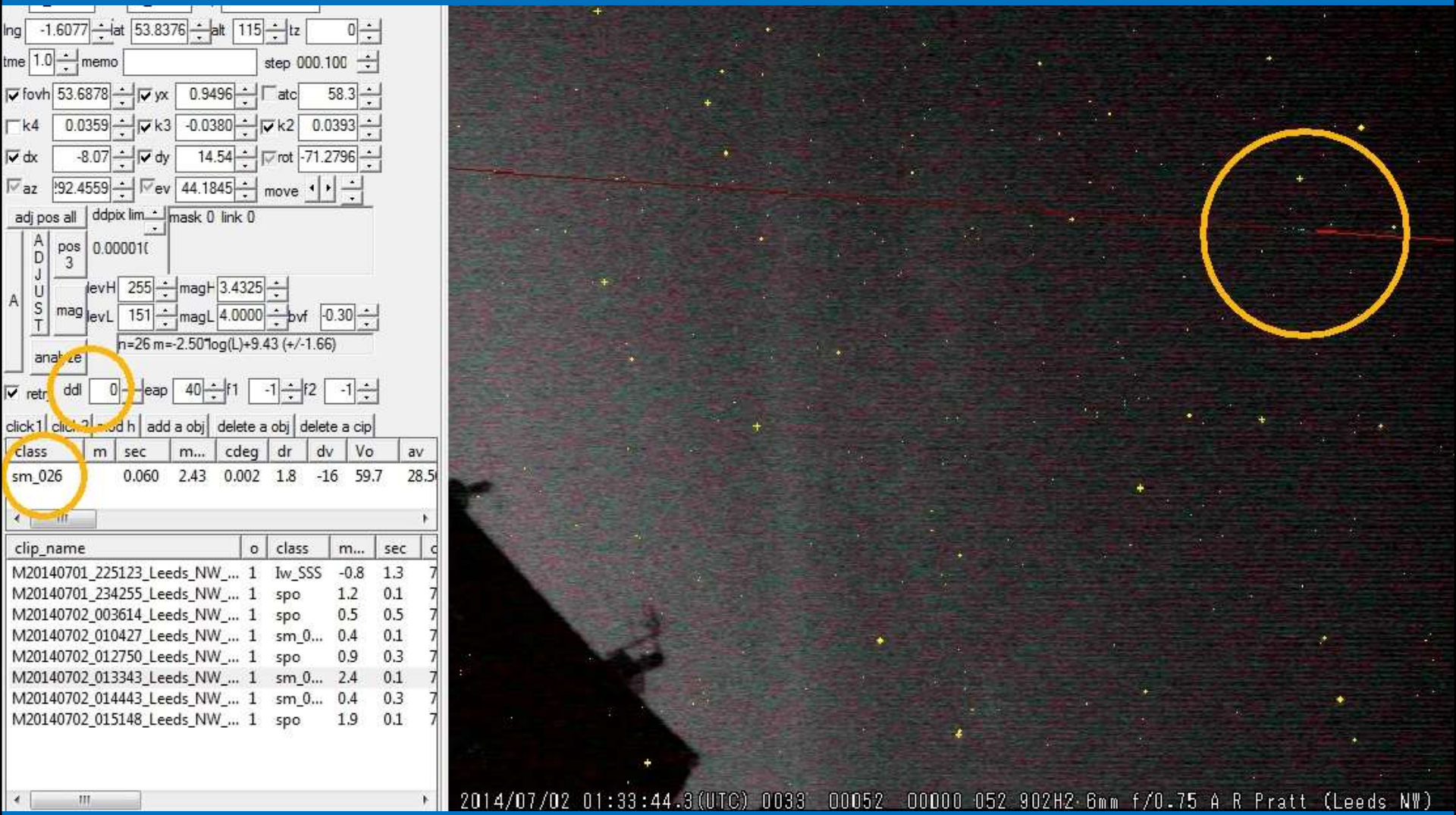
‘ddl’ and ‘leap’



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Object count - 2 concurrent meteors

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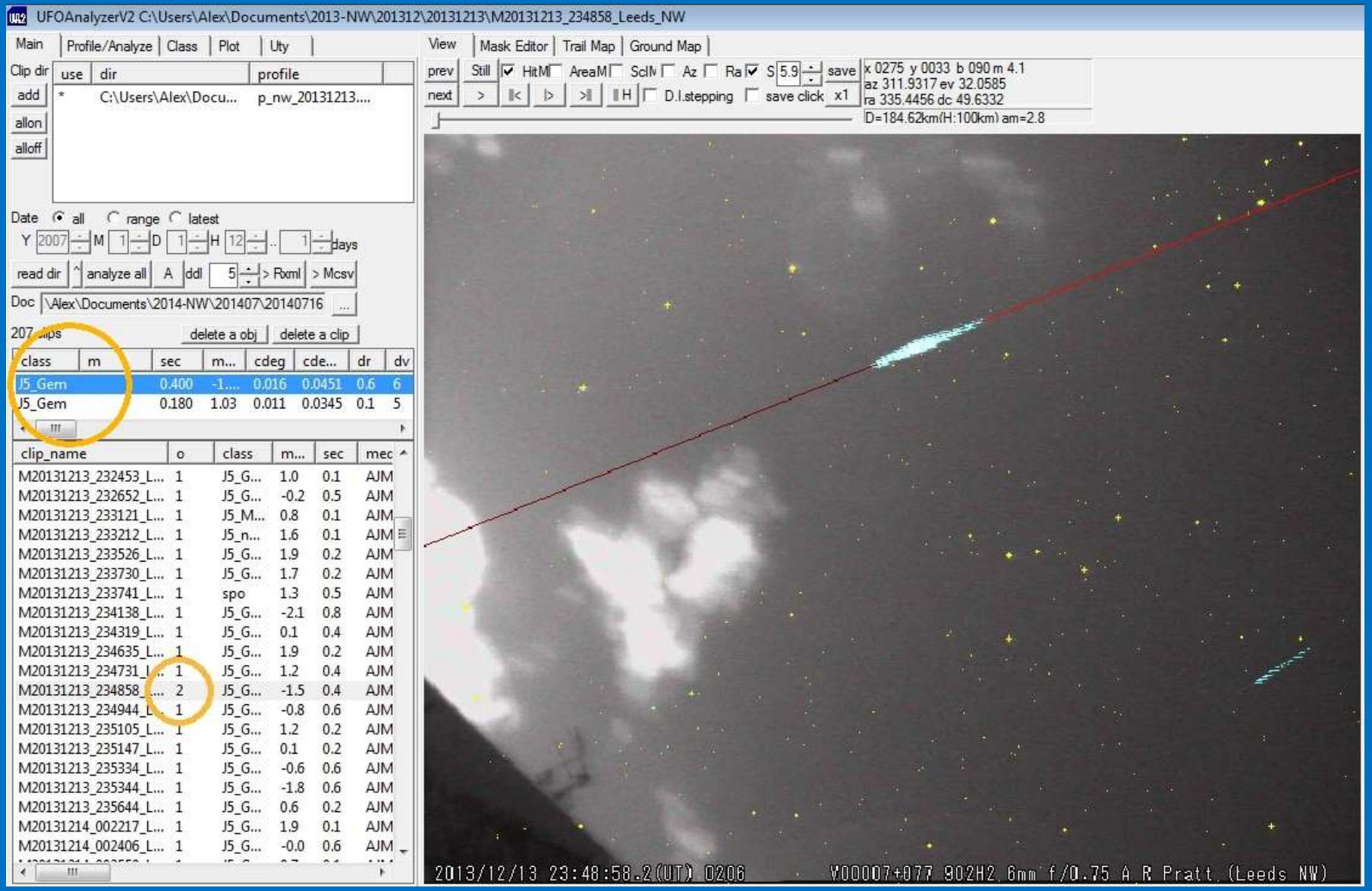

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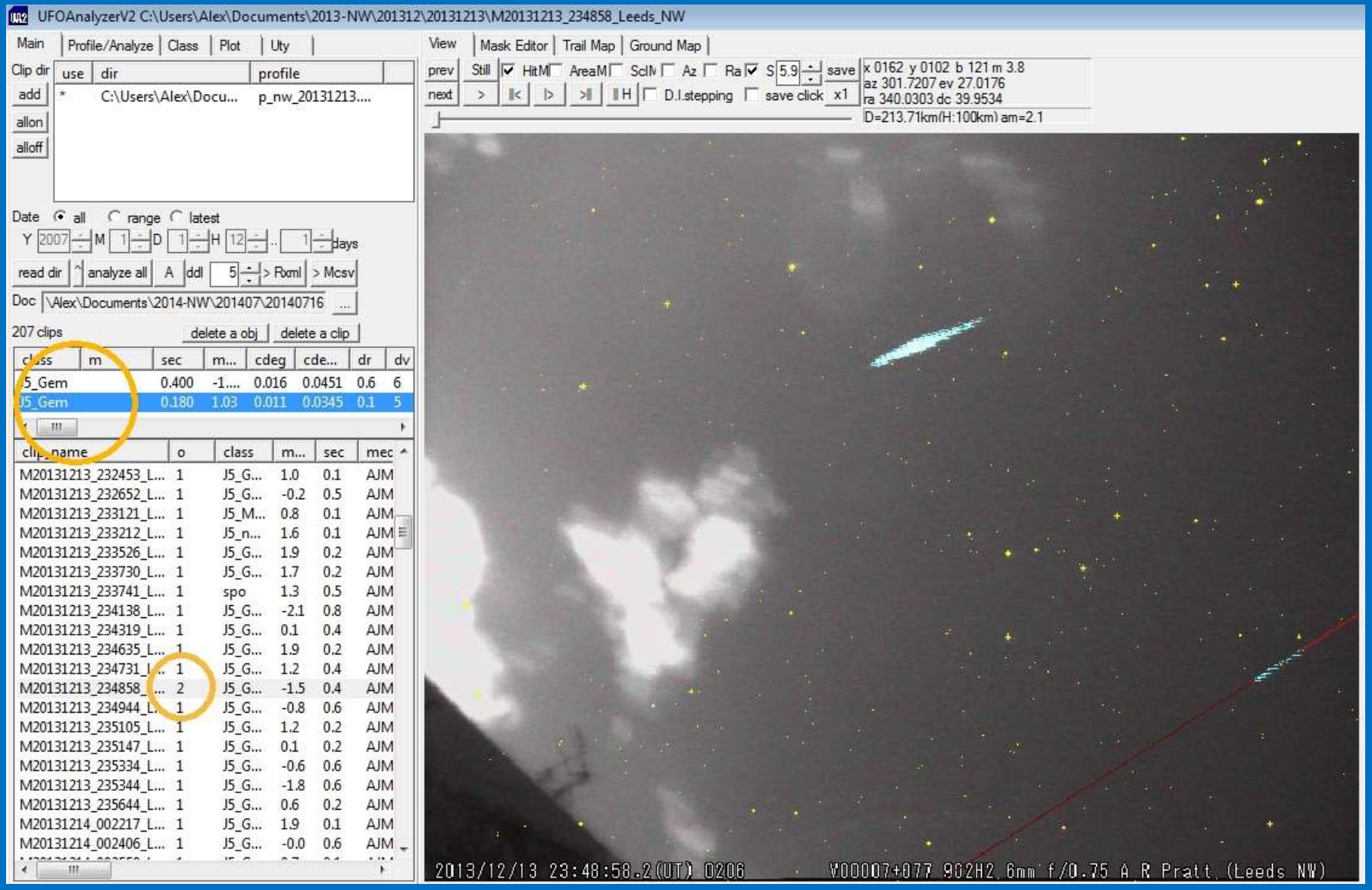
Object count - 2 concurrent meteors



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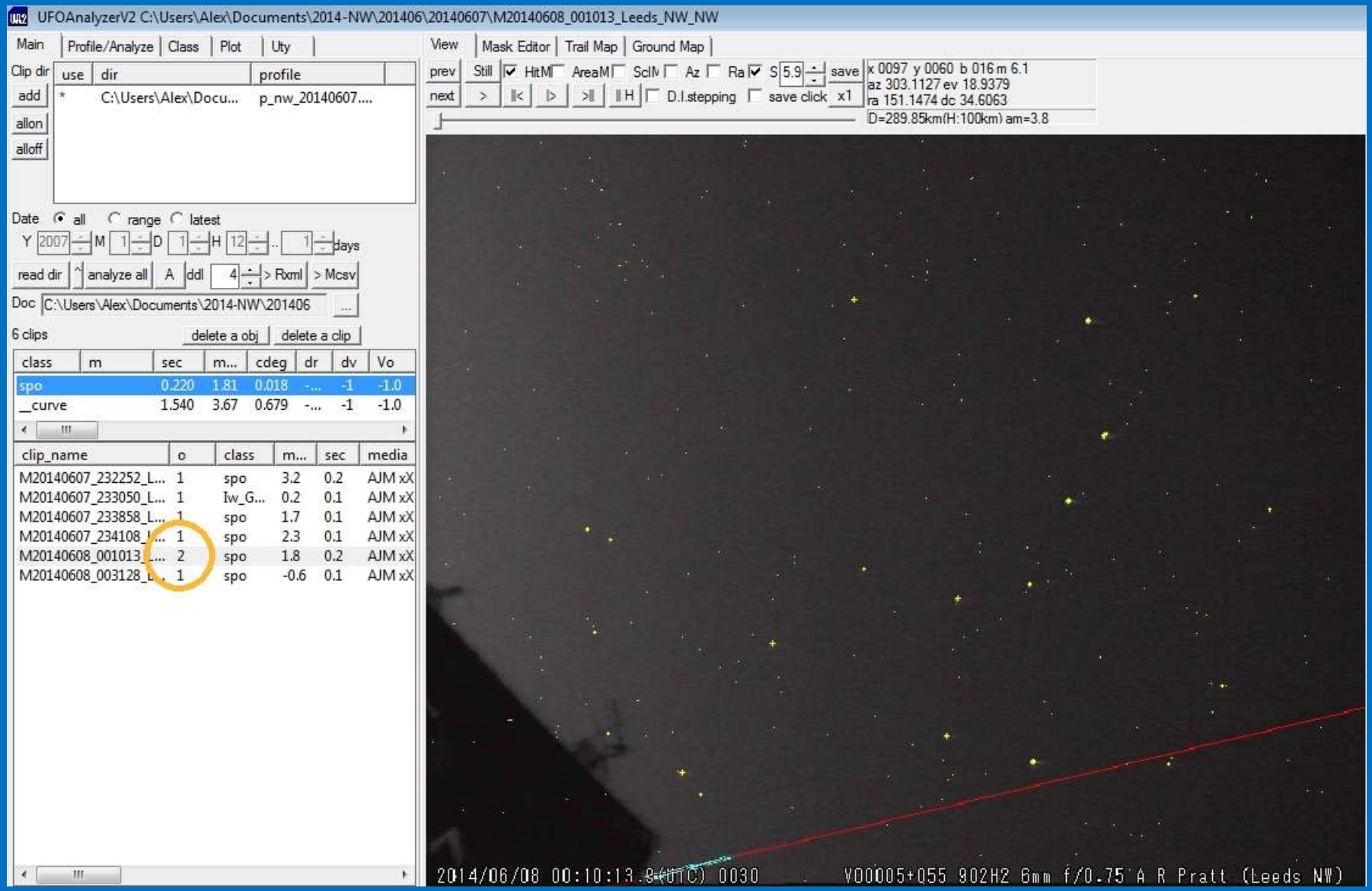
Object count - A sporadic meteor and a ‘curve’ event (noise)



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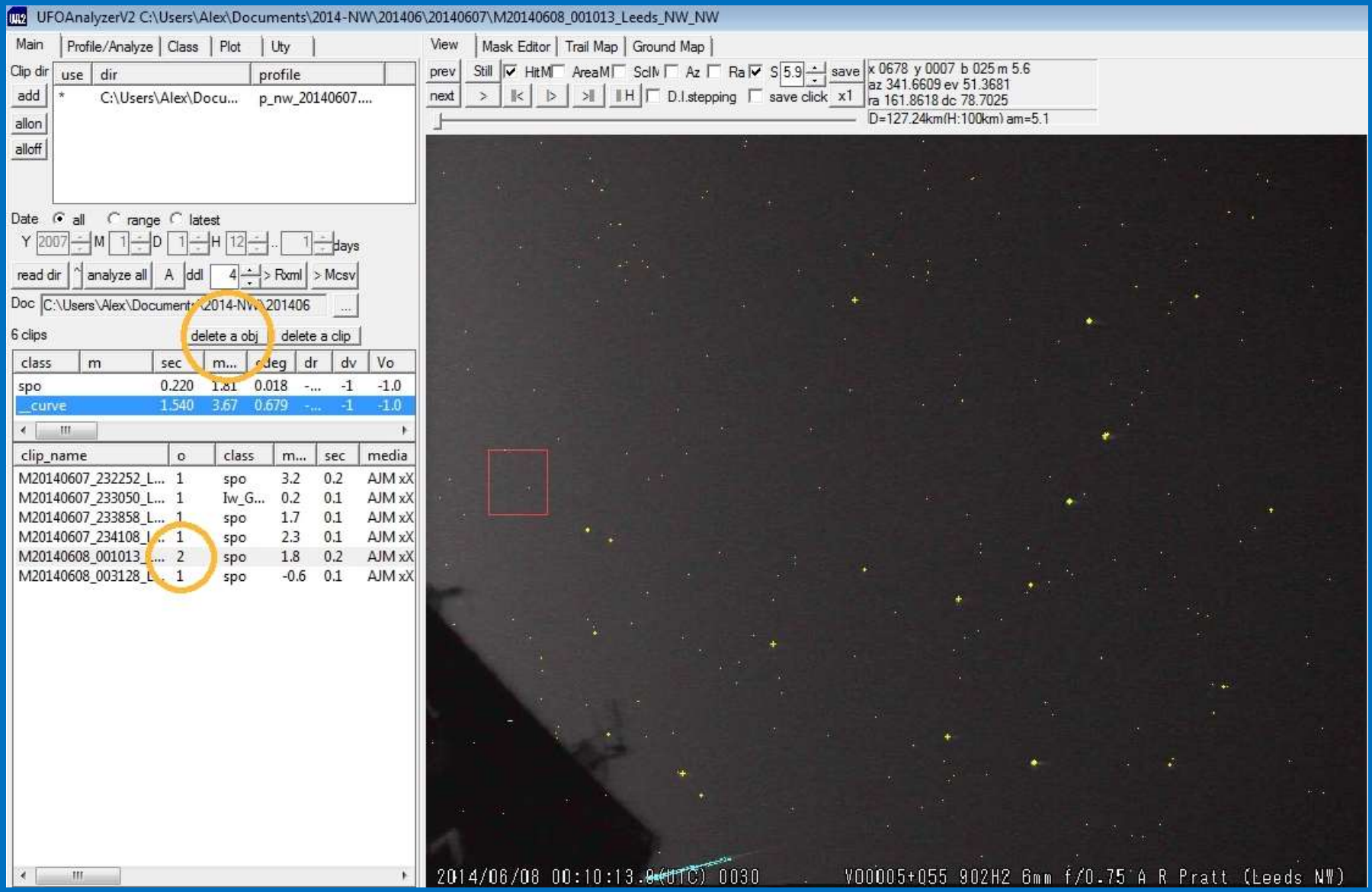
Object count - Use ‘delete a obj’ to remove the ‘_curve’ event



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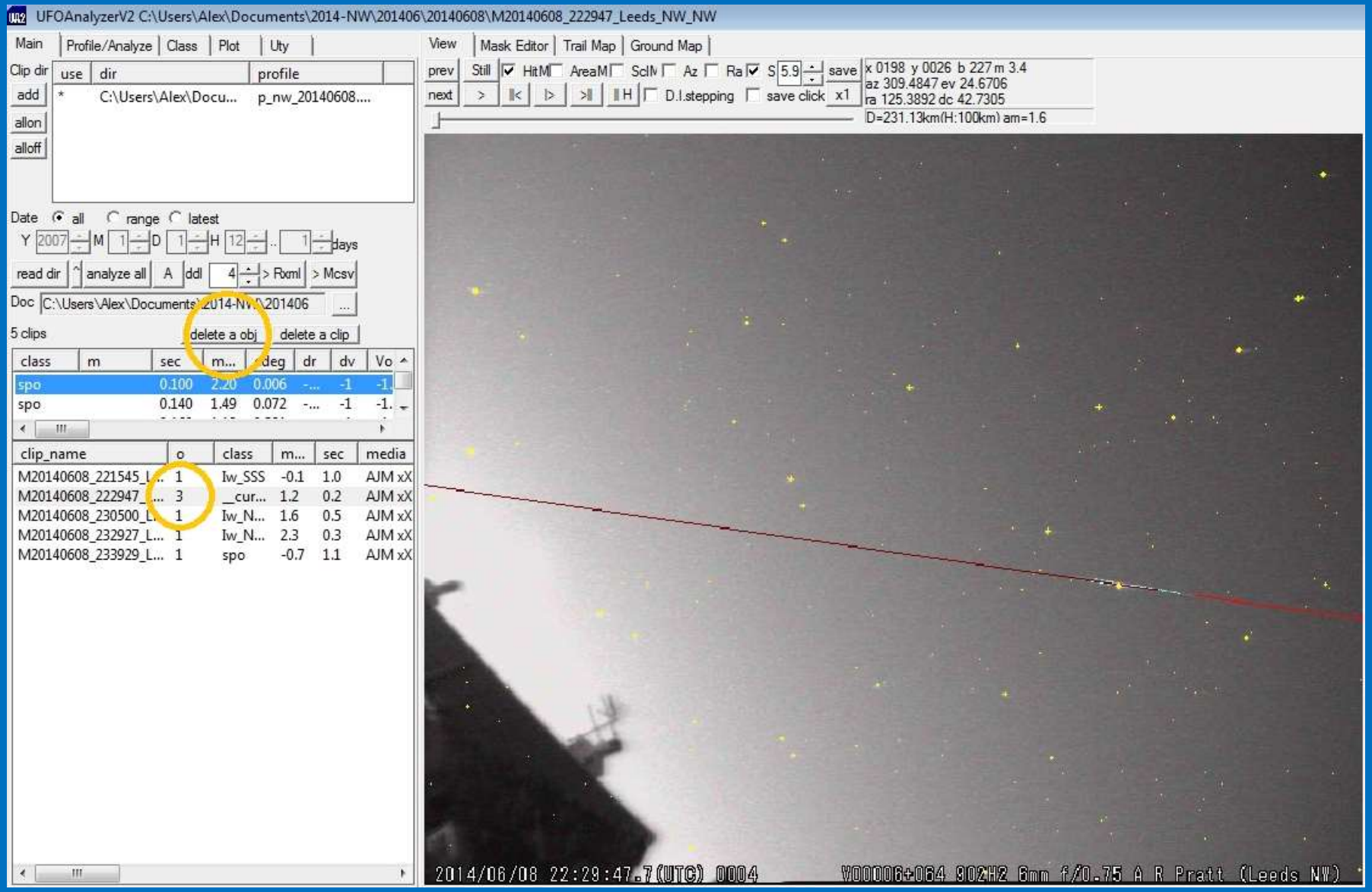
Object count - Multiple alignments to a single meteor trail



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Timestamps

Synchronise the *UFO Capture* PC with an accurate time source

UFO Orbit has a multi-event timing tolerance of 3s

Timing errors can produce:

- Missed mutual events
- Incorrect ground tracks
- Inaccurate orbital elements

A clip triggered by a bird or ‘plane sometimes captures a meteor
The meteor could be given an erroneous timestamp

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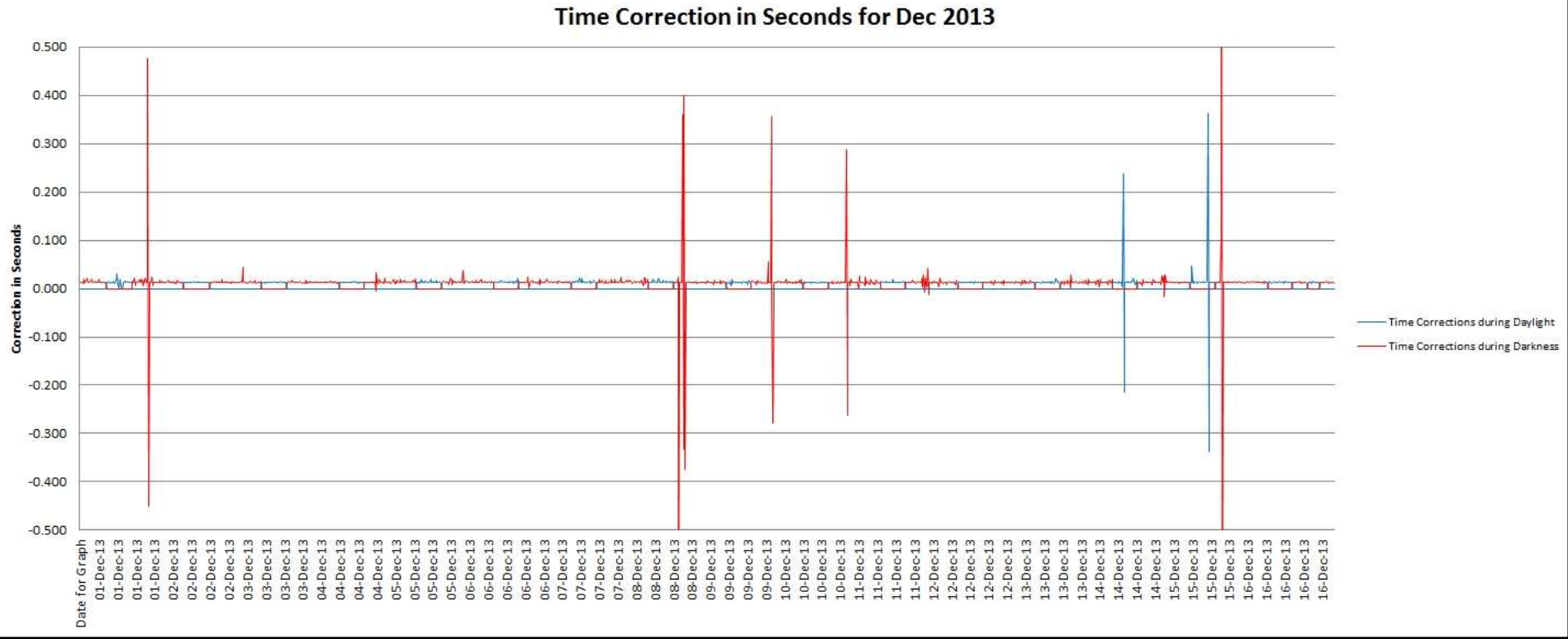
Accurate timestamps

Default ‘Windows Internet Time’

Dimension 4 http://www.thinkman.com/dimension4/

Internet Time Service (SNTP) – every 15 min



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Non-meteor trigger – a bird

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Timing corrections

Uty tab – time adjust – *all* clips

Bespoke timing correction:

- **Backup copy of M?.xml file**
- **Edit original M?.xml file – corrected timestamp**
- **Delete its M?A.XML file**
- **Run *UFO Analyser***
- **Save the new M?.csv file**

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“There’s more to life than Analyze All”

Quality checks:

- **Stellar registration profiles**
- **Trail alignments**
- **Timing checks**

Get the best results from our capture data!

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Recommended reference sources

UFO Capture Night Sky Observation Guide

http://sonotaco.com/soft/NSOG/index.html

UFO Analyser User's Manual

http://sonotaco.com/soft/download/UA2Manual_EN.pdf