

LYRA Occultation Data Analysis in Search for Ablation Signals from the GEMINID meteor shower 2010



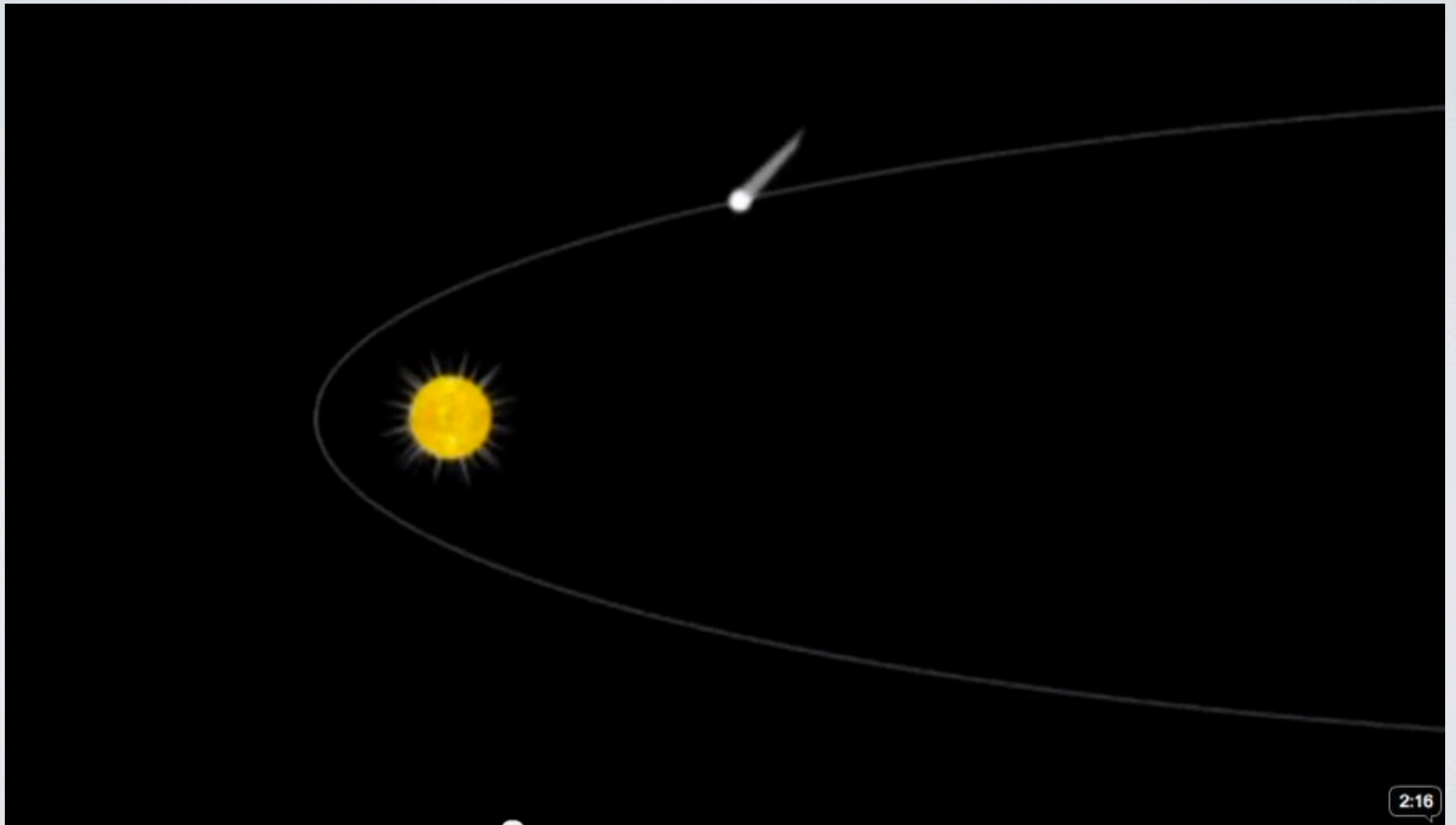
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1. ESA/ESTEC/SRE-OS+SRE-SO
2. International Meteor Organization, Am Observatorium 2, D-15848 Lindenberg
3. University of Utrecht, Astronomy Institute
4. Royal Observatory of Belgium, Brussels

The Geminid Meteor Shower



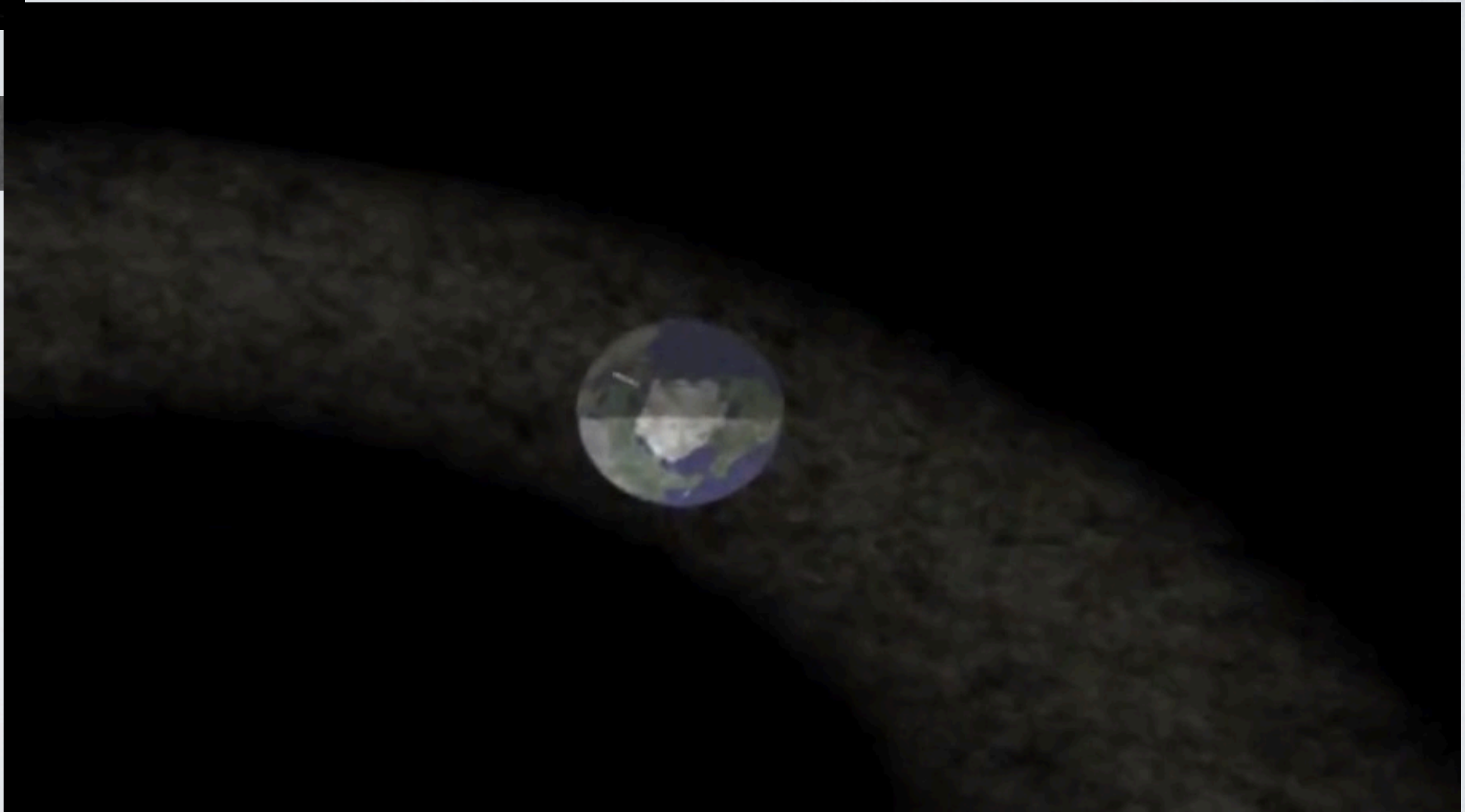
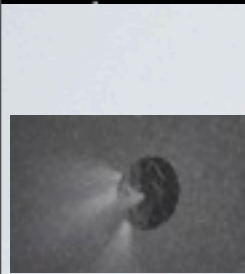
The Geminid Meteor Shower



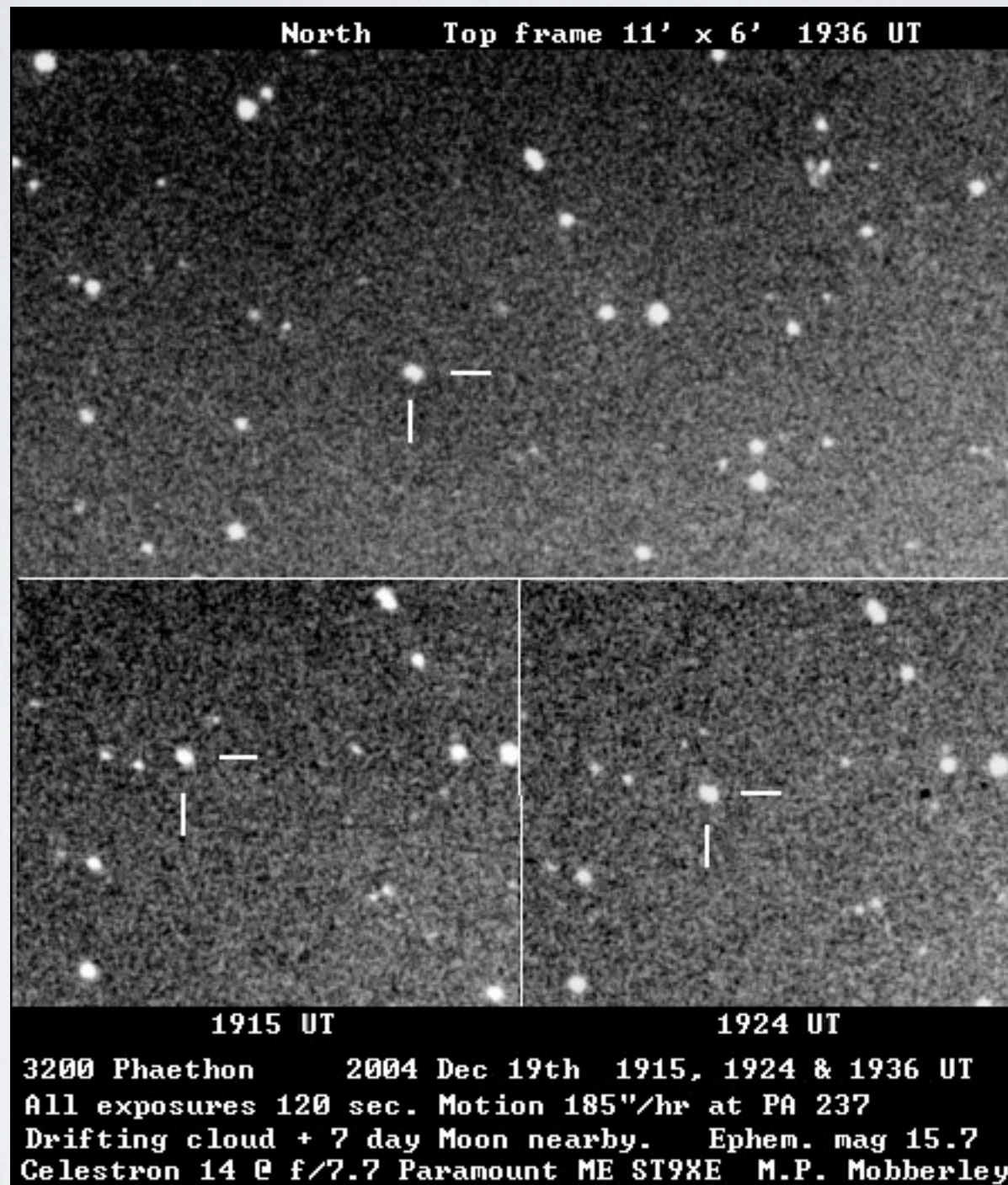
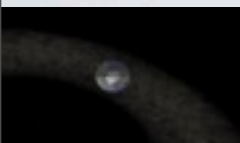
The Geminid Meteor Shower



The Geminid Meteor Shower

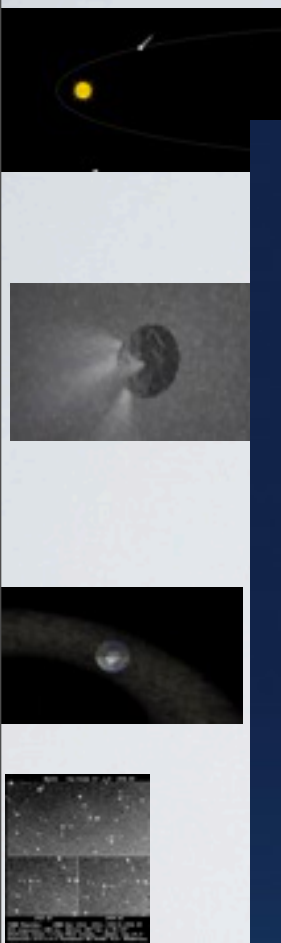
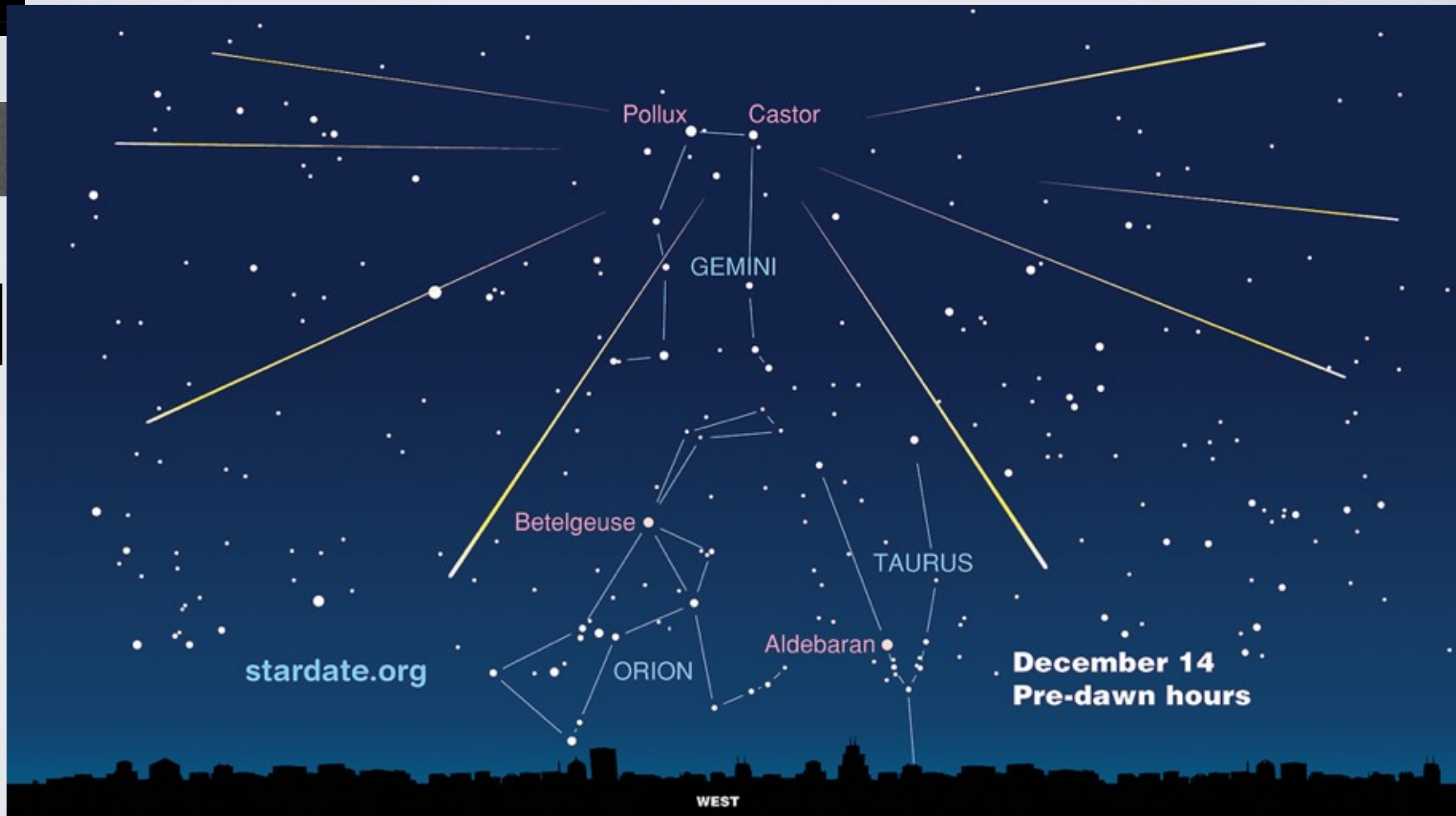


The Geminid Meteor Shower

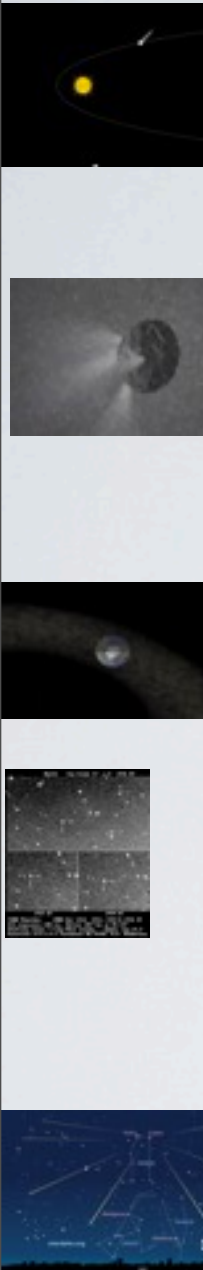


3200 Phaethon 2004 Dec 19th 1915, 1924 & 1936 UT
All exposures 120 sec. Motion 185"/hr at PA 237
Drifting cloud + 7 day Moon nearby. Ephem. mag 15.7
Celestron 14 @ f/7.7 Paramount ME ST9XE M.P. Mobberley

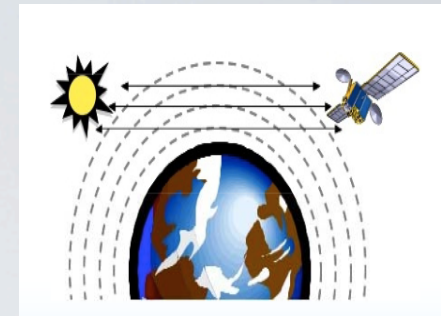
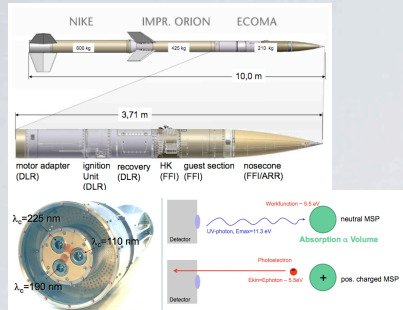
The Geminid Meteor Shower



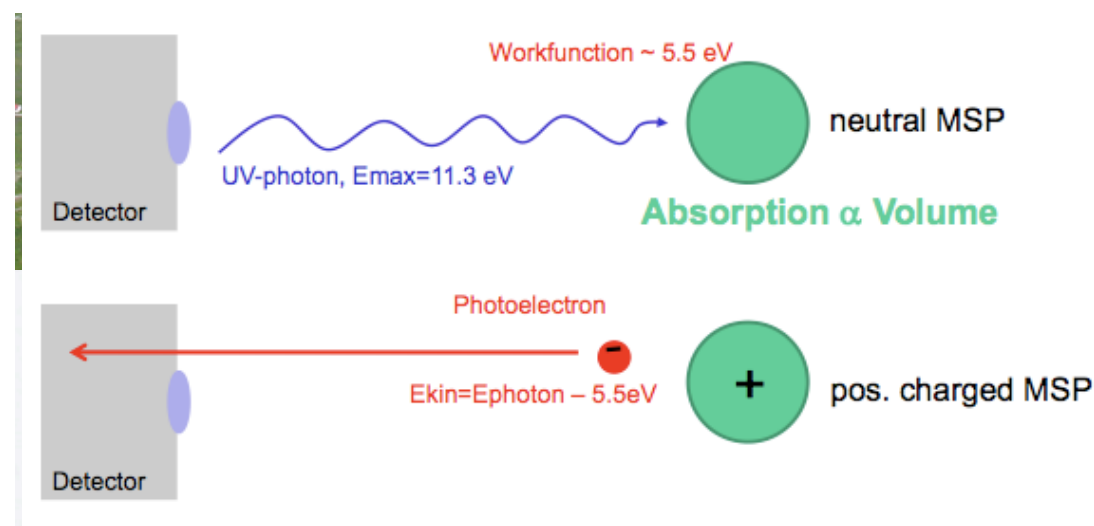
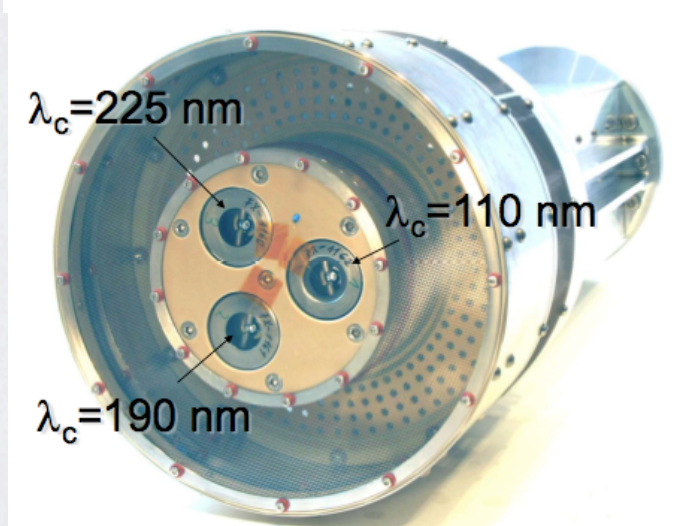
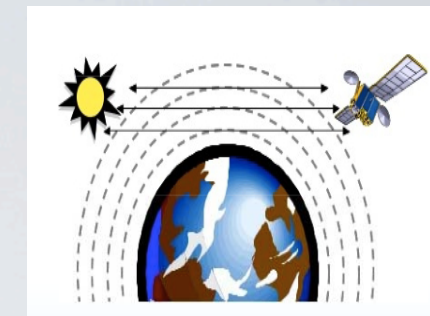
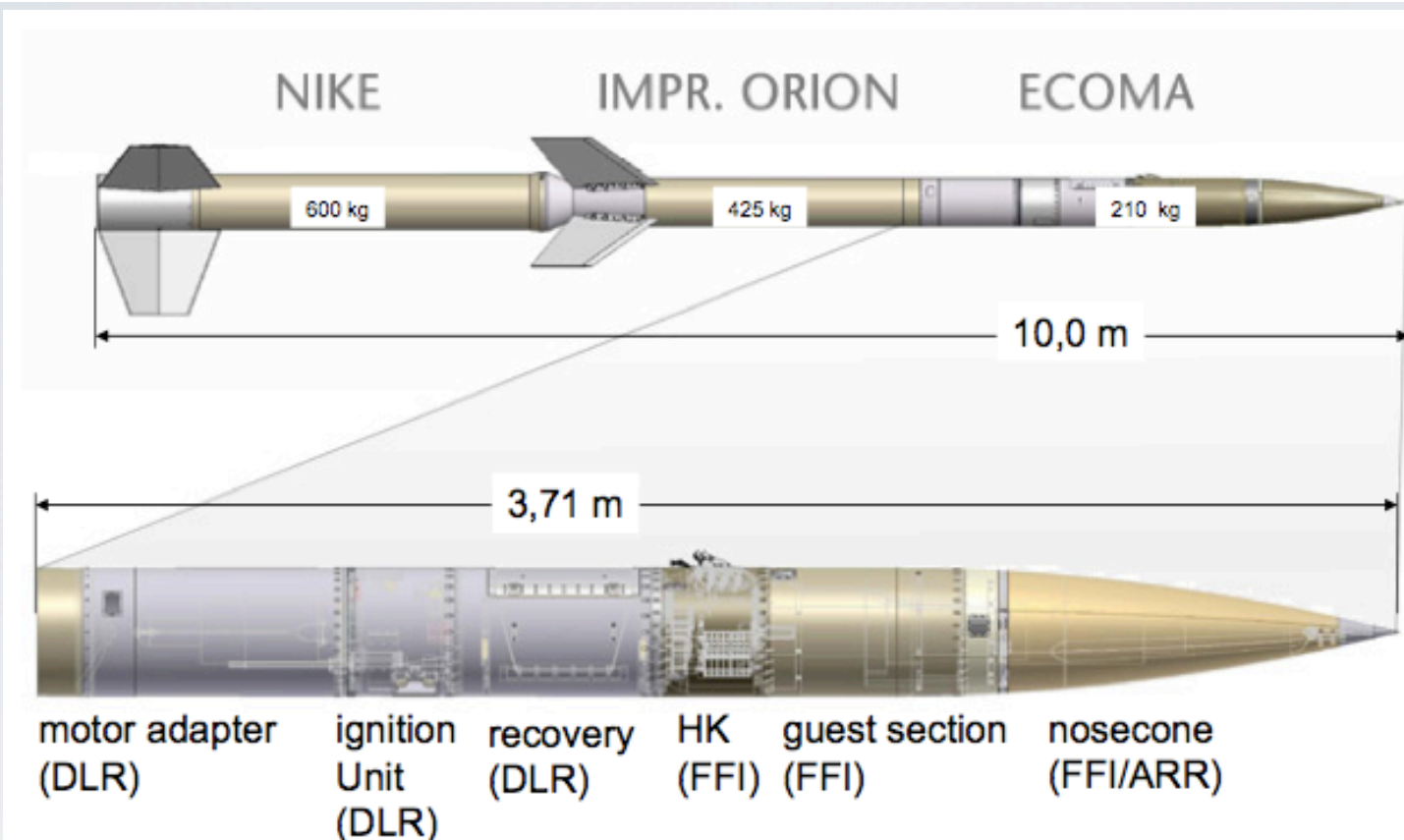
The Geminid Meteor Shower



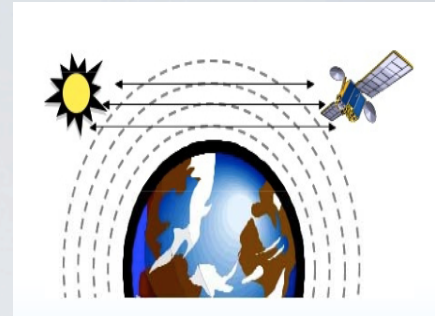
The Geminid Meteor Observation Campaign



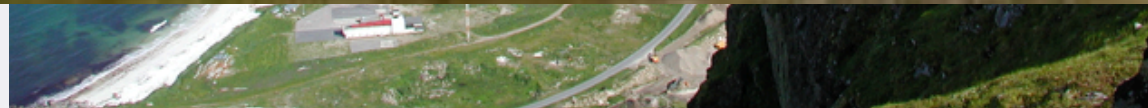
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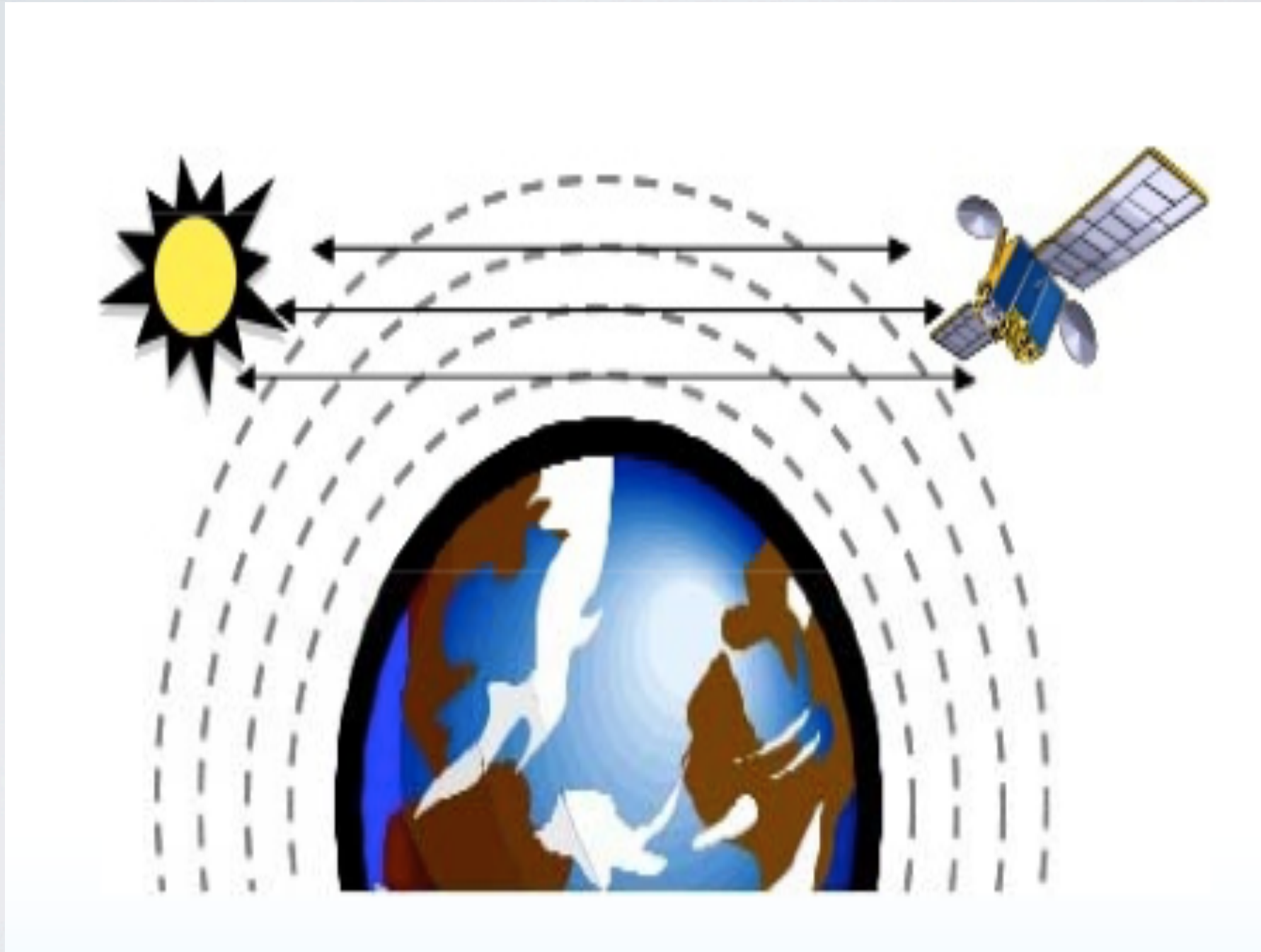
The Geminid Meteor Observation Campaign



The Geminid Meteor Observation Campaign



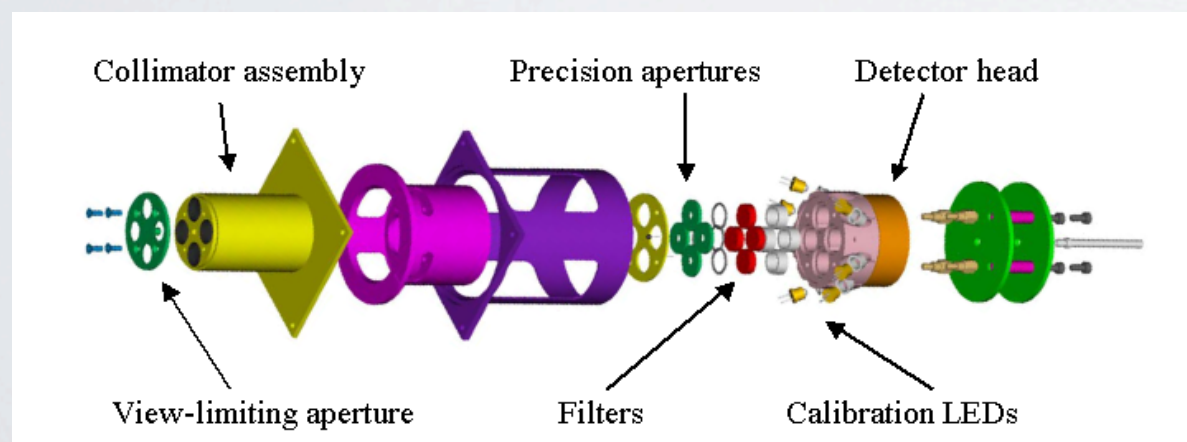
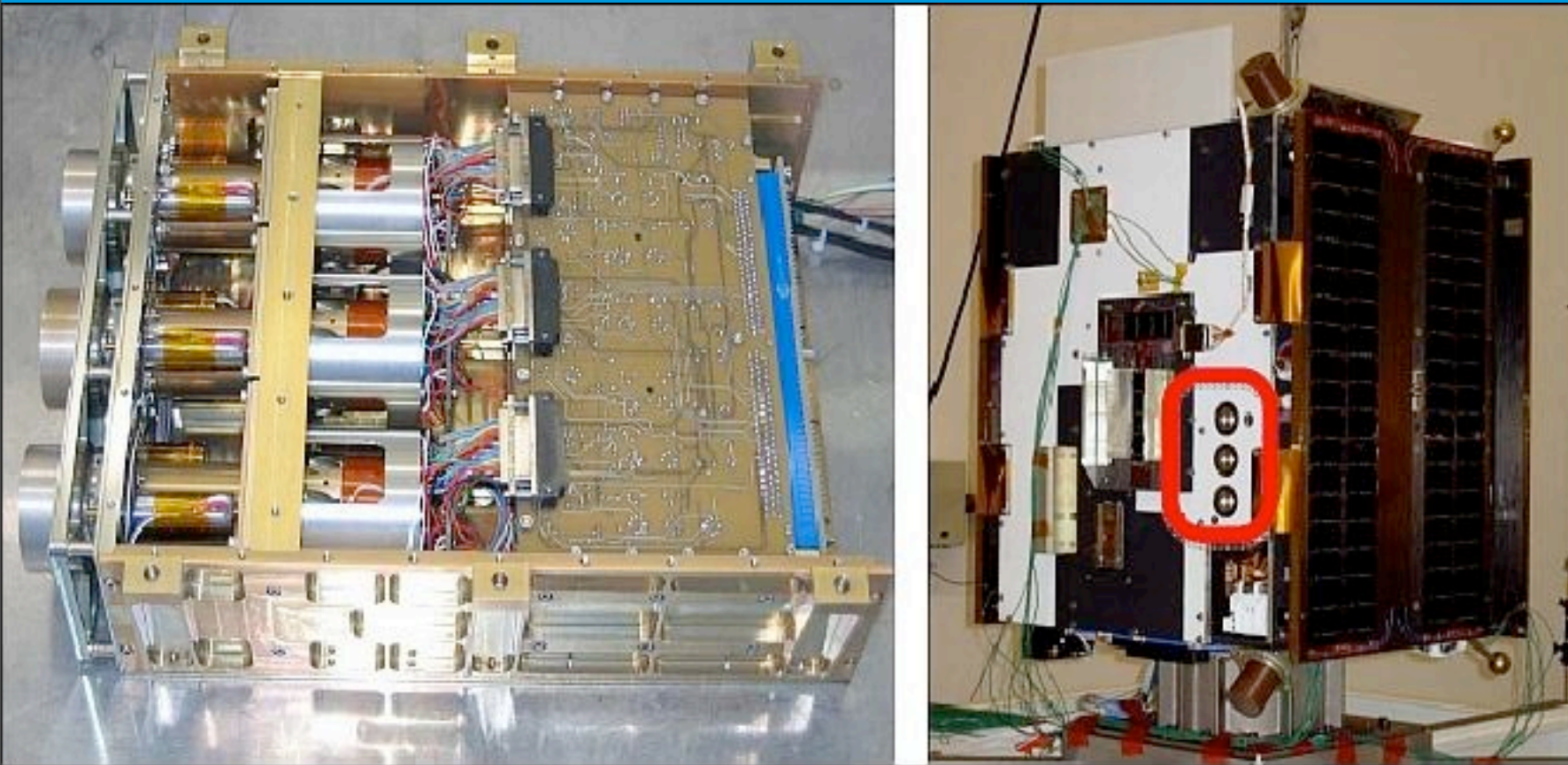
The Geminid Meteor Observation Campaign



The Geminid Meteor Observation Campaign

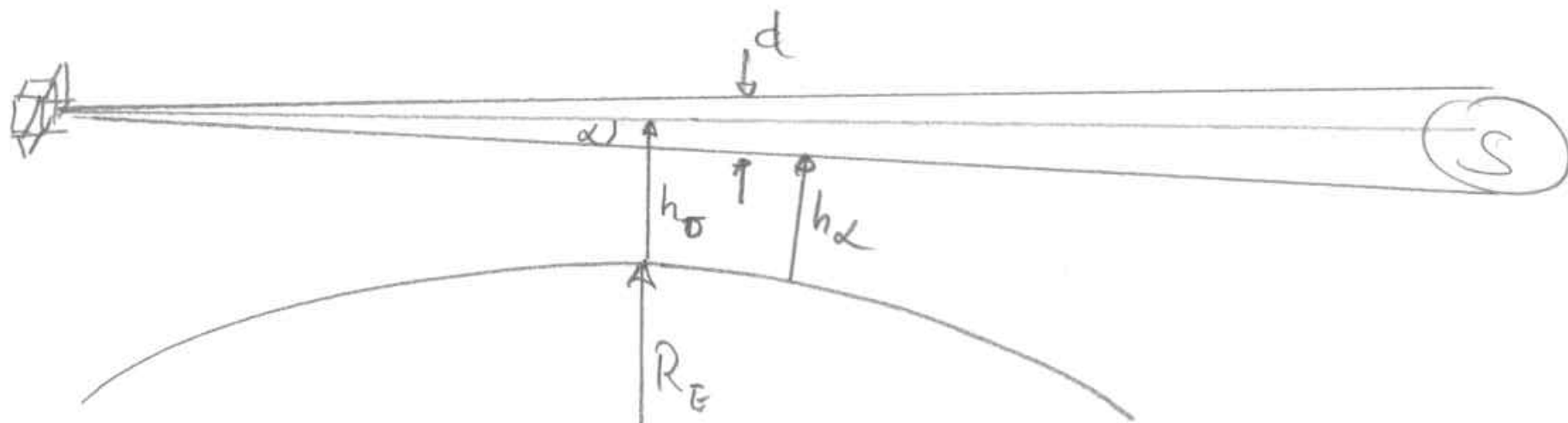


LYRA Occultation Campaign - The Instrument



<u>Channel</u>	<u>Wavelength[nm]</u>
Zirconium	6 - 20
Aluminum	18 - 80
Herzberg	120 - 123
Lyman-A	190 - 222

<u>Components</u>
O, O2, N2
O, O2, N2
O2
O2, O3



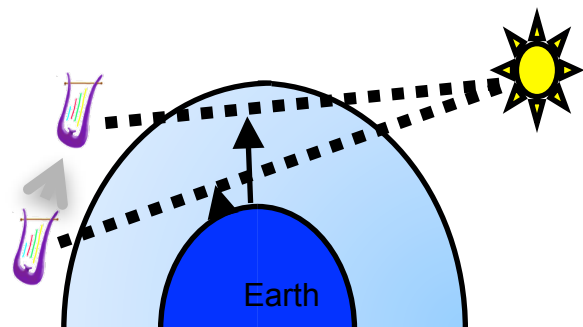
h_0 : mean tangent altitude

Lyra FOV: 2.05°

$$\alpha \approx \frac{0.53}{2} \approx 0.27^\circ$$

$$h_0 \approx 80 \text{ km} \leadsto d \approx 20 \text{ km}$$

$$\text{with sampling of } 100 \text{ Hz} \leadsto \Delta h_0 = 23 \text{ m}$$



LYRA Occultation Campaign



Double click to
unzoom

LYRA Quick Look Viewer (LV2)

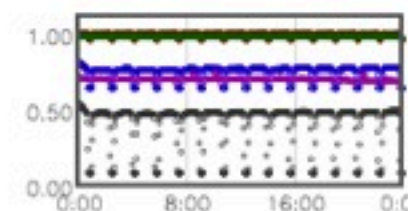
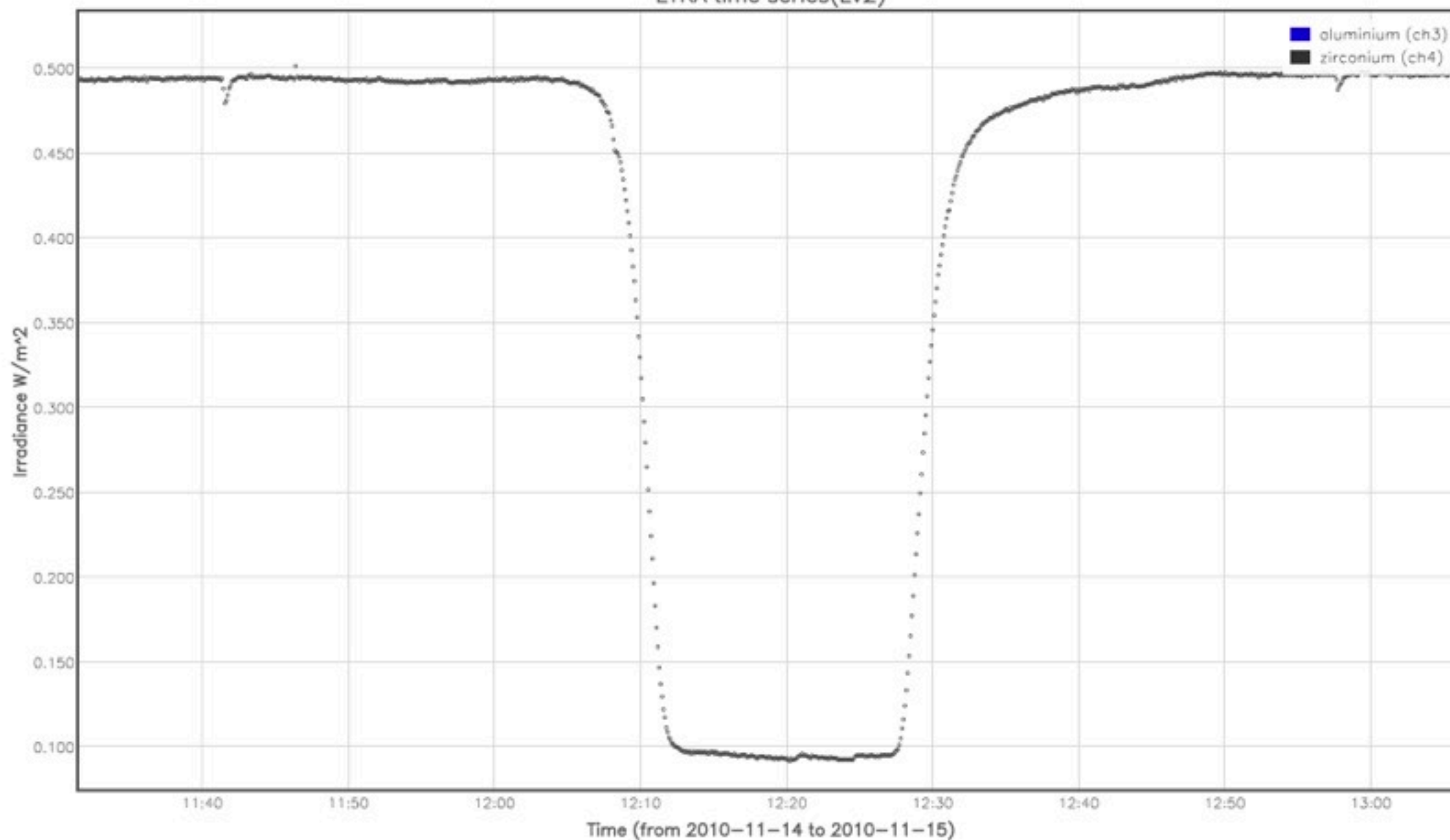


Begin time: 2010-11-14T00:00:00 End time: 2010-11-15T00:00:00 Duration (s): 86400 Previous Next Use Previous and Next buttons: ☐ OK
Type: std Show line: ☐ Point size: 3 Full Screen Save Plot Help

level
level1 ☐ level2 ☒

data source
fits file ☐ multi fits files ☒

LYRA time series(LV2)

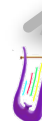


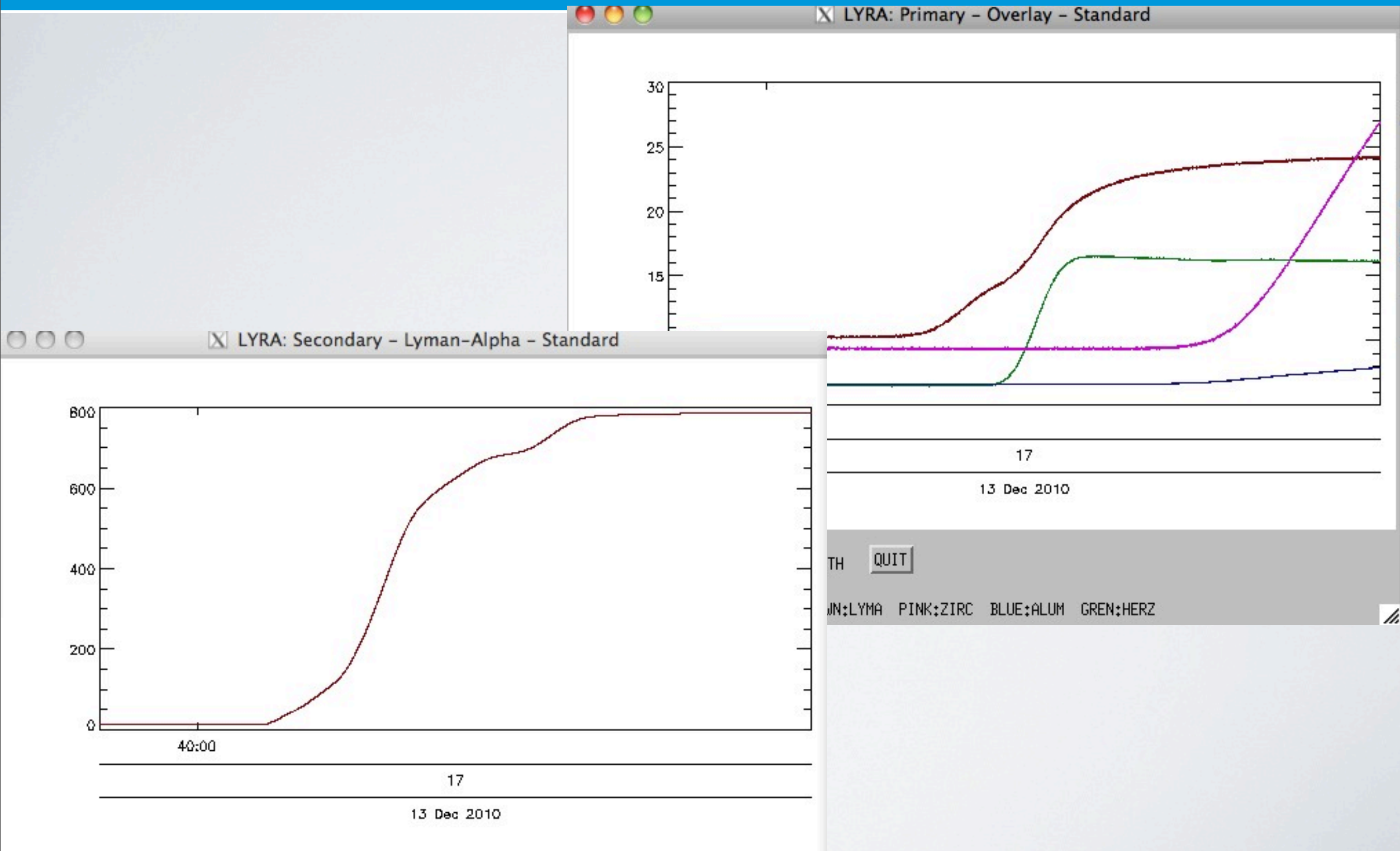
Show:

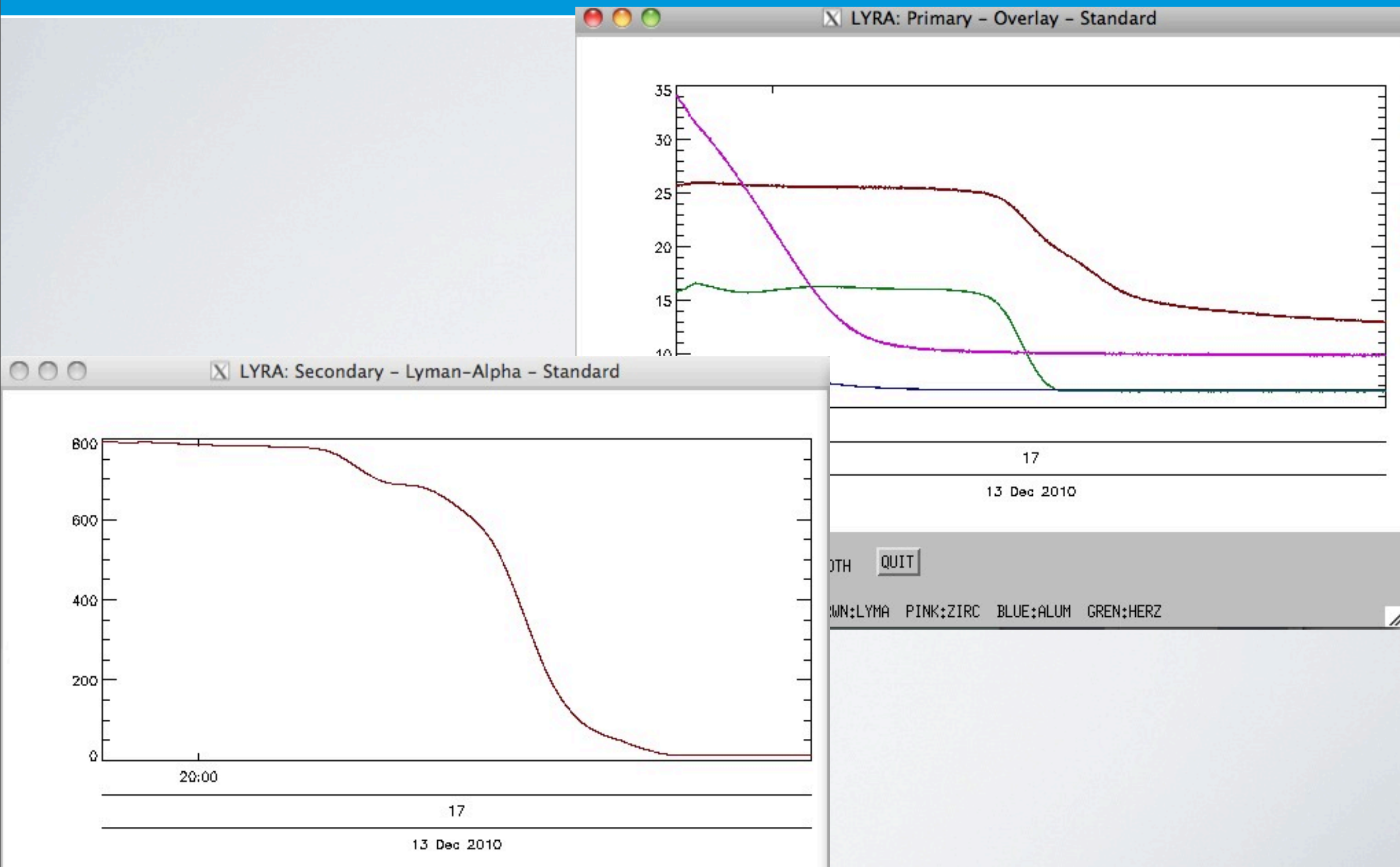
☐ lyman alpha (ch1)
y = 160 .(x - 0)
☐ herzberg (ch2)
y = 1.44 .(x - 0)
☒ aluminium (ch3)
y = 331 .(x - 0)
☒ zirconium (ch4)
y = 535 .(x - 0)
☐ swap avg. intens. (lv1)
y = 0.0534 .(x - 0)

Autoscale: ☒

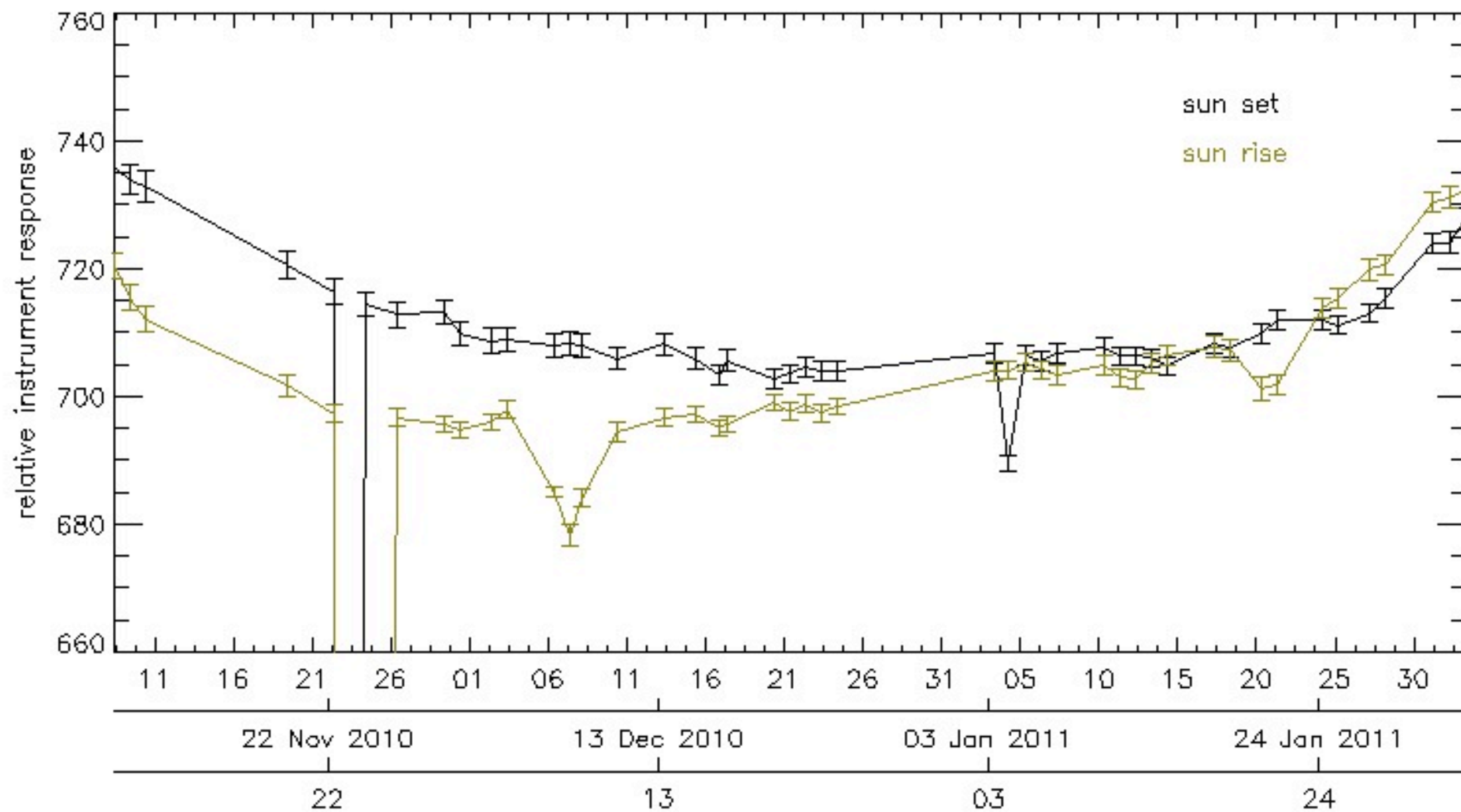
Enable Tooltip: ☐







LymanAlpha(90[km])



- ▶ **Atmospheric ablation products were not clearly identified in the occultation data**
- ▶ **similar results were obtained by:**
 - ▶ **by Correira et al (2010), GOME 2 on ERS-2, search for Mg and Mg+**
 - ▶ **by Kozak et al (2006), UARS, search for temperature changes**
 - ▶ **Fussen et al (personal communication): UARS**
- ▶ **some more work is needed before final conclusion of this analysis can be given**