LYRA status update

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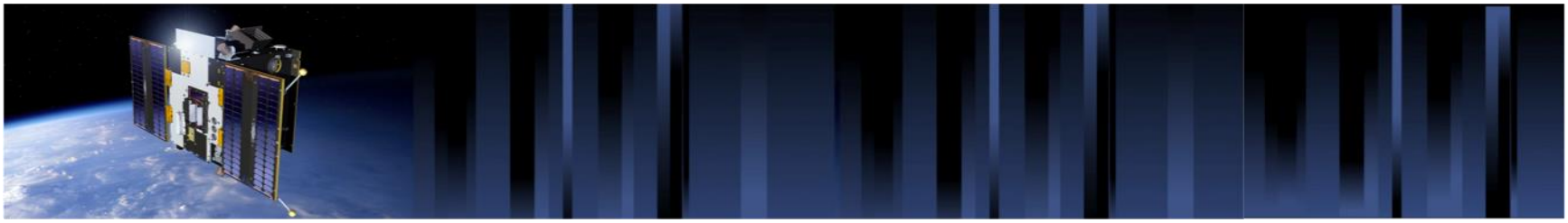
SWT, ESWW14, 28/11/2017

Latest news



- PROBA2 is currently extended till end-2018
  - Further extension by ESA SPC is not considered, discussion are ongoing with SSA
- Winners of the 8th Guest Investigator call have been selected:
  - 3 proposals related to LYRA

Instrument health

Degradation

- Status on February 15, 2016

Channel	Remaining signal
Unit 1	
Channel 1-1	62%
Channel 1-2	75%
Channel 1-3	100%
Channel 1-4	100%

Channel	Remaining signal
Unit 2	
Channel 2-1	0.6%
Channel 2-2	0.03%
Channel 2-3	3%
Channel 2-4	30%

Channel	Remaining signal
Unit 3	
Channel 3-1	61%
Channel 3-2	9%
Channel 3-3	19%
Channel 3-4	71%

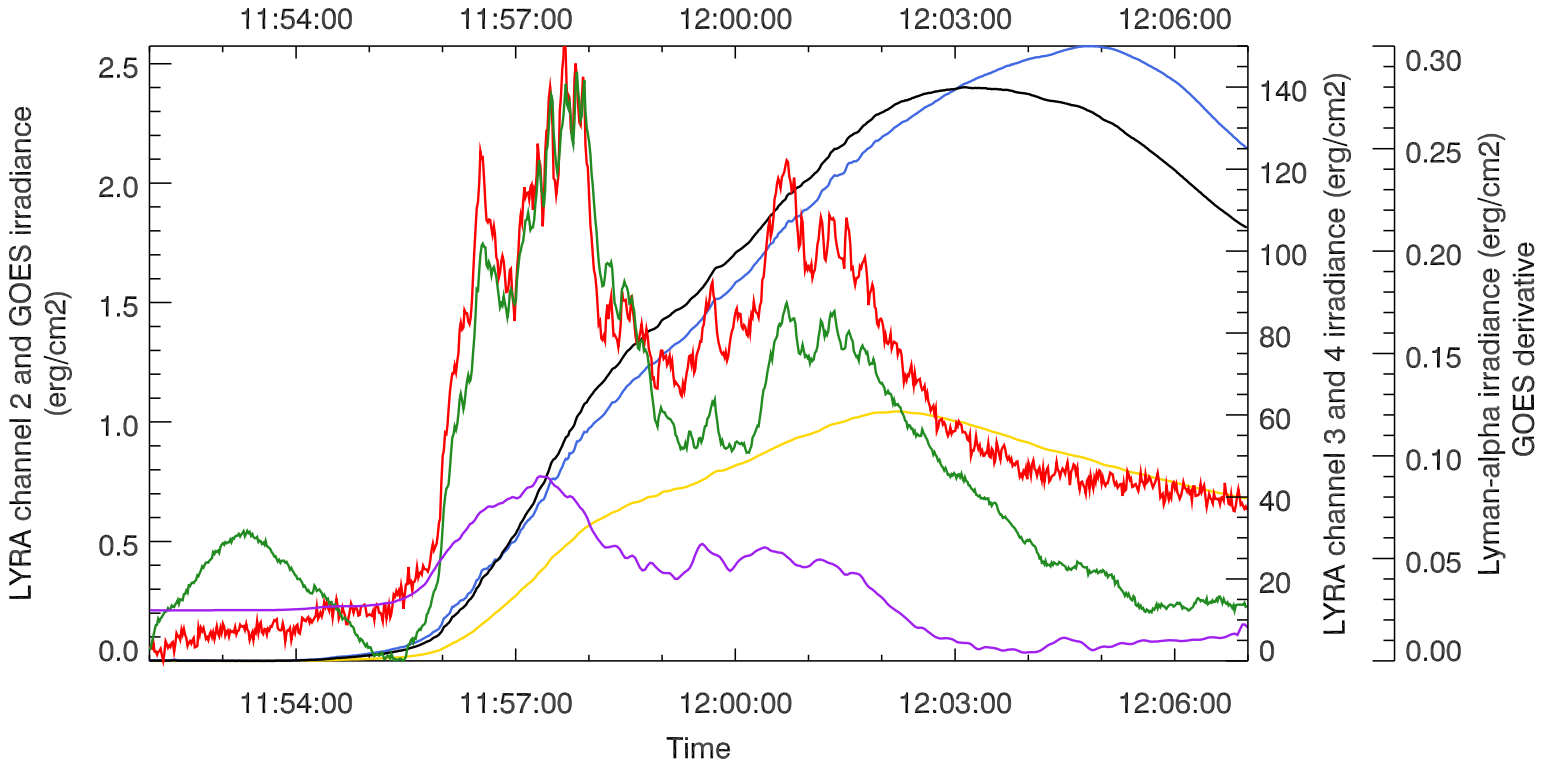
=> Slow evolution

Use of unit 1 for sporadic observation campaigns

- To compensate for the degradation of the nominal and backup unit, the calibration unit (unit1) can be exceptionally opened
  - Examples:
    - the SUMER campaign coordinated by J.C. Vial in April 2017
    - a flare hunting campaign in September 2017
    - planned: a joint campaign with FOXSI-3 in August 2018

Latest results

The biggest flare of Solar cycle 24 observed in all four LYRA channels

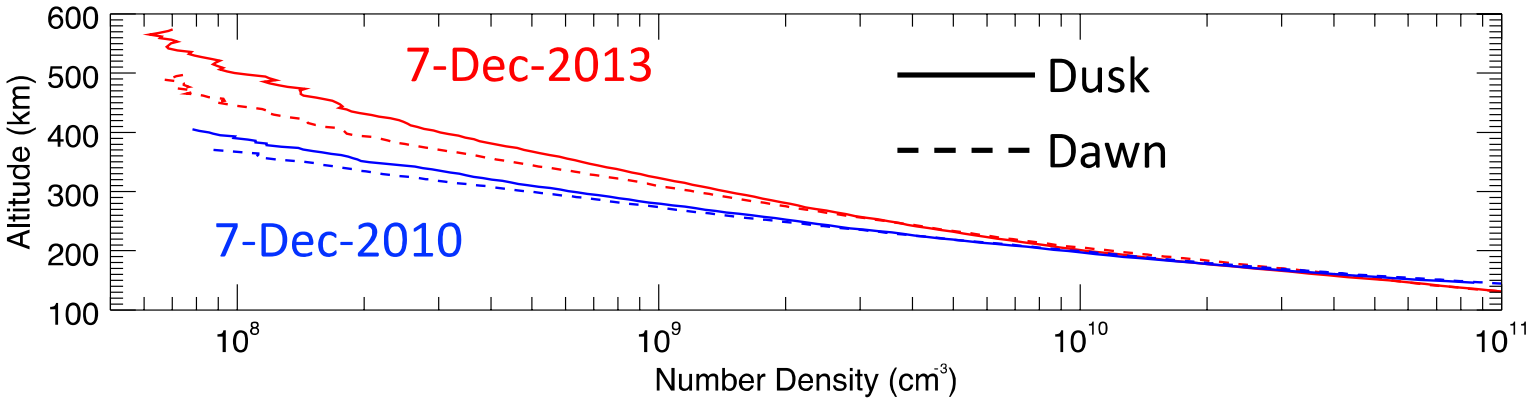


X9.3 flare of September 6, 2017
Flare hunting campaign with LYRA calibration unit
Signature in the Lyman alpha and Herzberg channels

Dominique et al. in prep

Retrieval of O+N2 densities from LYRA occultation data

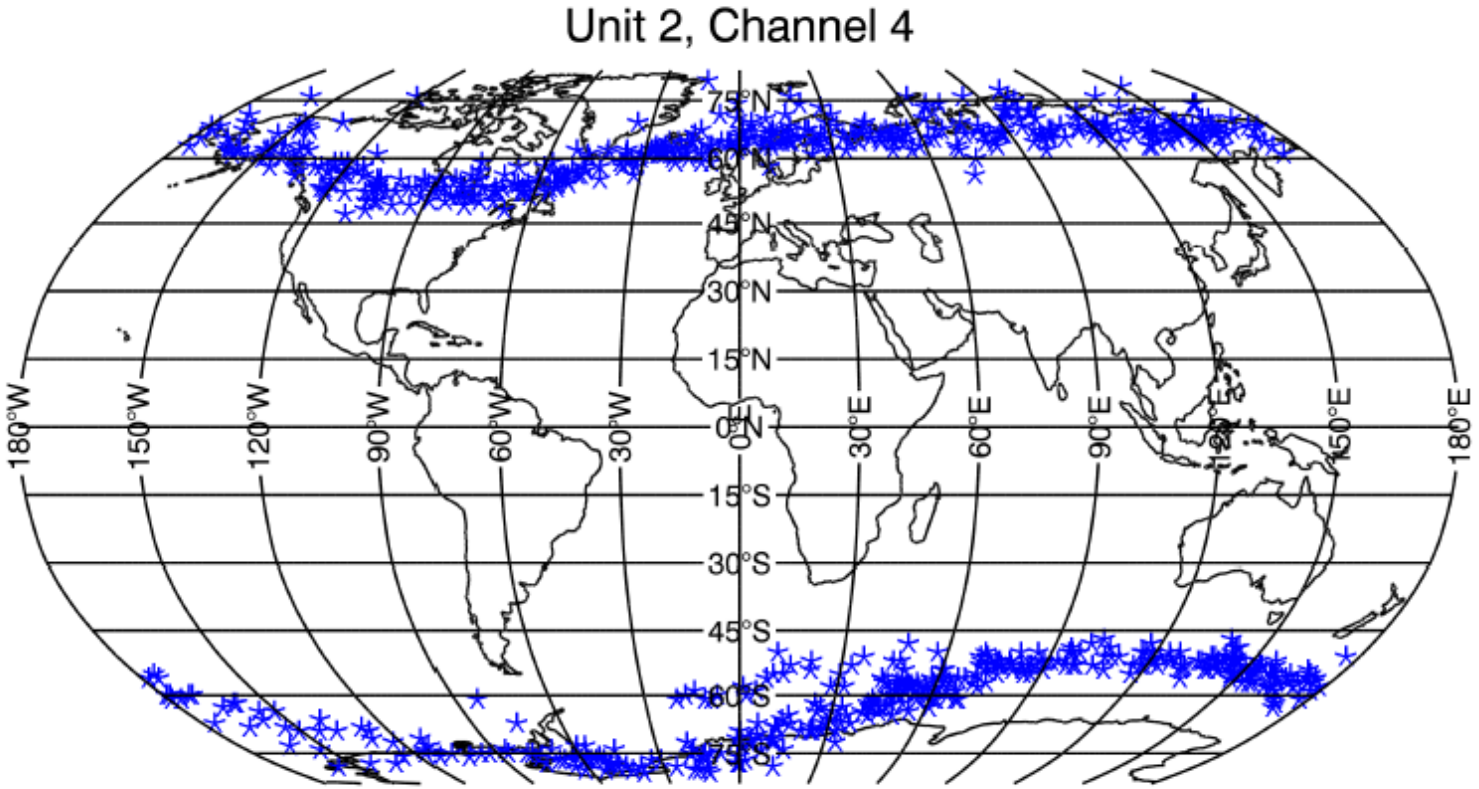
New data product !!!
developed in the frame of the 7th GI Programme
by Dr. E Thiemann from LASP, Colorado



Available (soon in nearly real-time) at
http://proba2.oma.be/lyra/data/EarthAtmosphere/

Thiemann et al. submitted

Post-geomagnetic storm detection of ultra-relativistic electrons by LYRA



Katsiyannis et al. submitted

J. Space Weather Space Clim., xx, LetterNumber (2017)
DOI: 10.1051/swsc/2017017

SWSC

RESEARCH ARTICLE OPEN ACCESS

Multi-instrument observations of the solar eclipse on 20 March 2015 and its effects on the ionosphere over Belgium and Europe

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Received 25 July 2016 / Accepted 3 July 2017

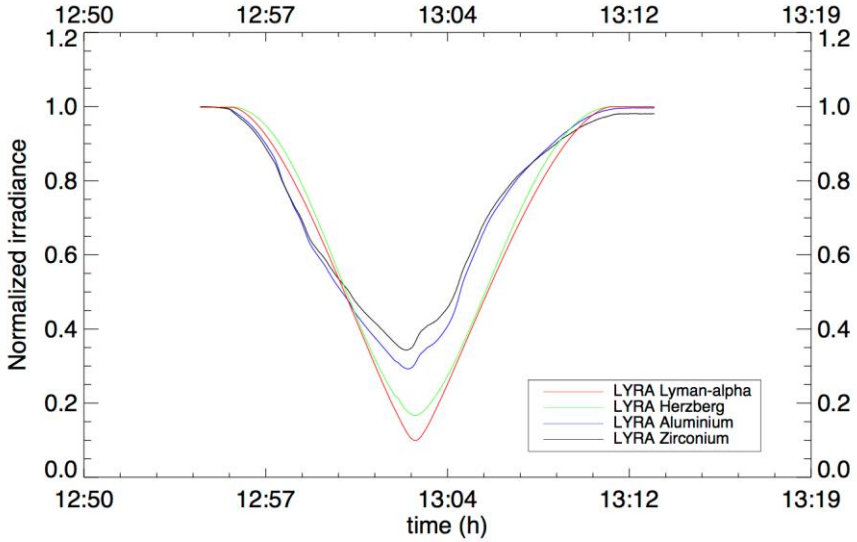
ABSTRACT

A total solar eclipse occurred on 20 March 2015, with a totality path passing mostly above the North Atlantic Ocean, which resulted in a partial solar eclipse over Belgium and large parts of Europe. In anticipation of this event, a dedicated observational campaign was set up at the Belgian Solar-Terrestrial Centre of Excellence (STCE). The objective was to perform high-quality observations of the eclipse and the associated effects on the geospace environment by utilising the advanced space- and ground-based instrumentation available to the STCE in order to further our understanding of these effects, particularly on the ionosphere. The study highlights the crucial importance of taking into account the eclipse geometry when analysing the ionospheric behaviour during eclipses and interpreting the eclipse effects. A detailed review of the eclipse geometry proves that considering the actual obscuration level and solar zenith angle at ionospheric heights is much more important for the analysis than at the commonly referenced Earth's surface or at the plasmaspheric heights. The eclipse occurred during the recovery phase of a strong geomagnetic storm which certainly had an impact on (some of) the ionospheric characteristics and perhaps caused the omission of some "low-profile" effects. However, the analysis of the ionosonde measurements, carried out at unprecedented high rates during the eclipse, suggests the occurrence of travelling ionospheric disturbances (TIDs). Also, the high temporal and spatial resolution measurements proved very important in revealing and estimating some finer details of the delay in the ionospheric reaction and the ionospheric disturbances.

Key words. Sun – Solar eclipse – Eclipse geometry – Ionosphere – Irregularities

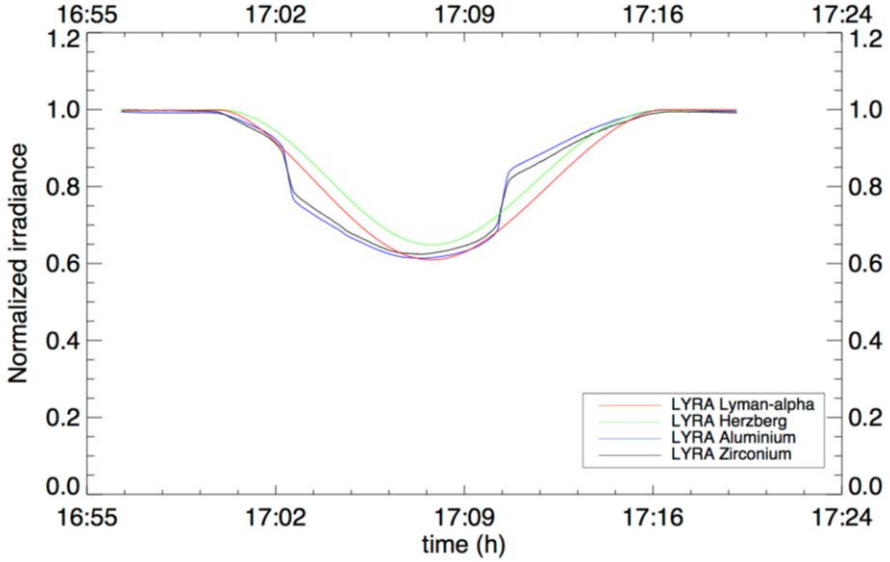
Eclipse observations by LYRA

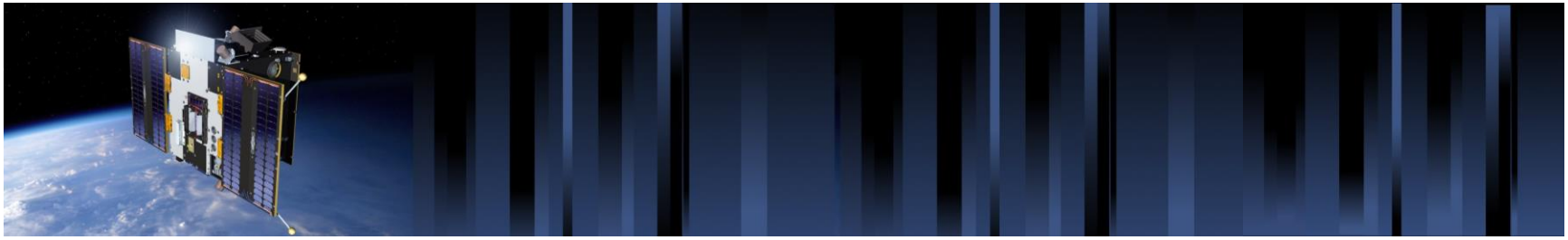
New observations:



February 2, 2017

August 21, 2017





ORB – KSB

wrc pmod

esa

CSL

THANKS!

LASP

P.N.Lebedev Physical Institute of the Russian Academy of Science

LPC2E

belspo

MPS

Max-Planck-Institut für Sonnensystemforschung