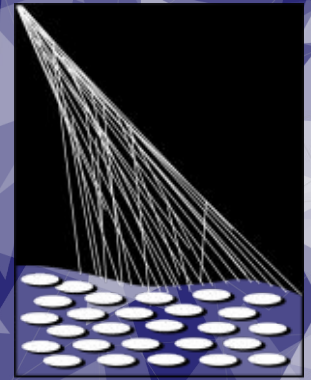


Observation of the modulation of the galactic cosmic ray flux with solar cycles at the Pierre Auger Observatory.



PIERRE
AUGER
OBSERVATORY

Jennifer Grisales-Casadiegos

Advisors:

Roberto Mussa, Luis A. Núñez



Latin American alliance for
Capacity building in Advanced physics

LA-CoNGA physics

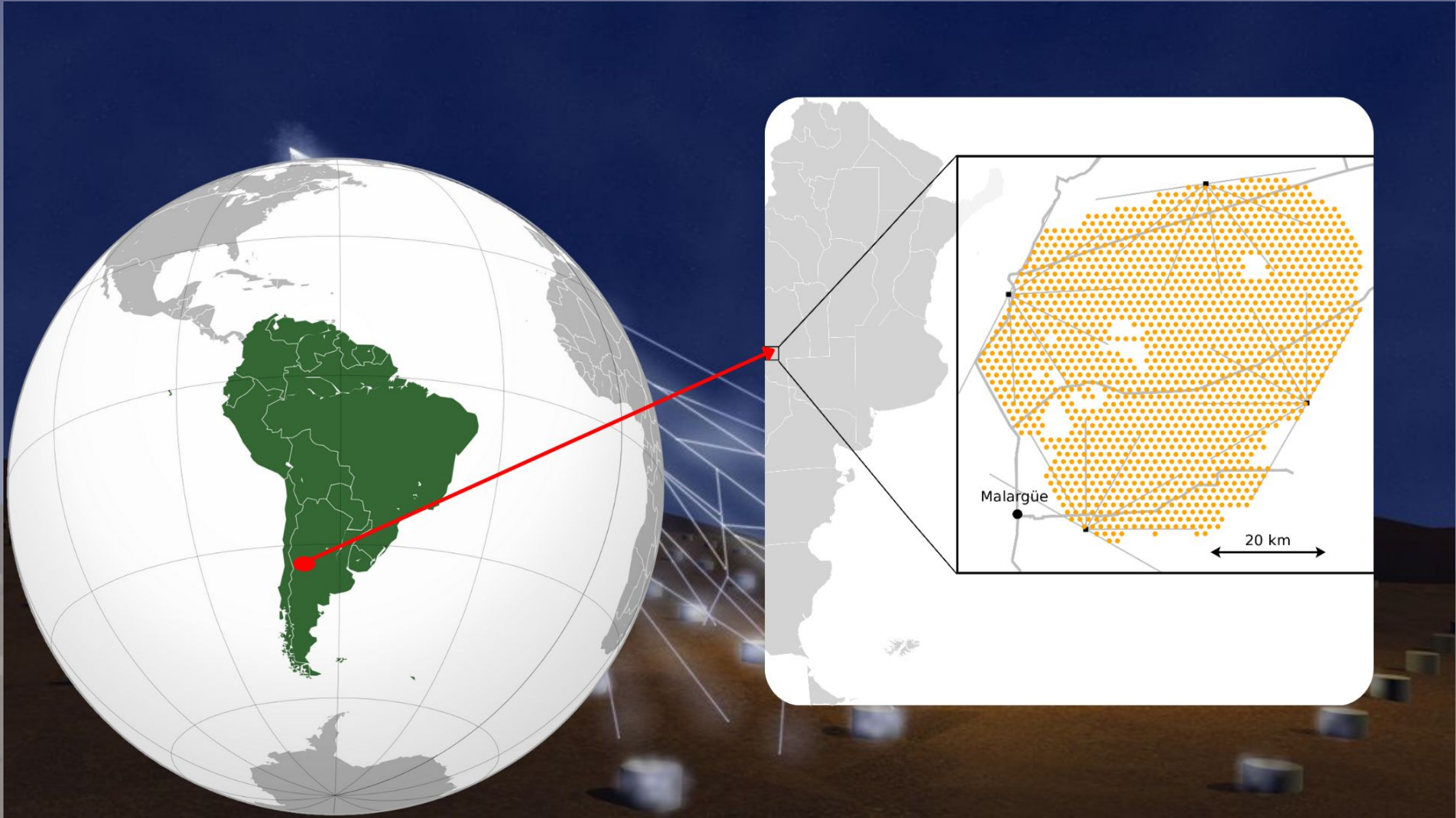


Cofinanciado por el
programa Erasmus+
de la Unión Europea



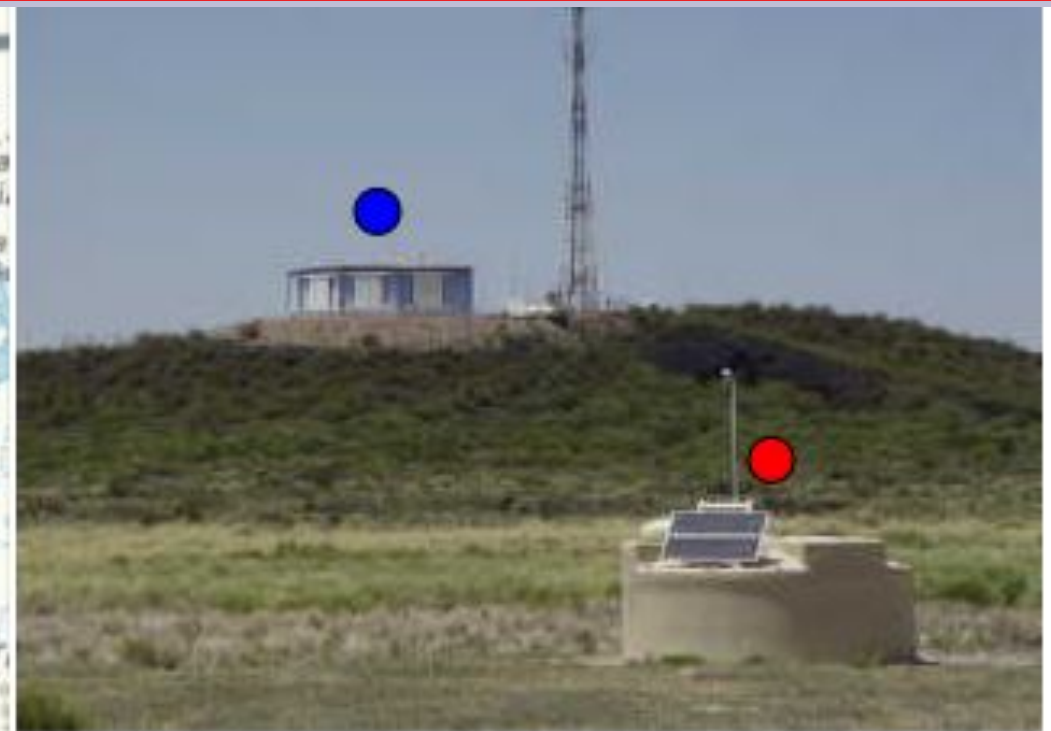


The Observatory





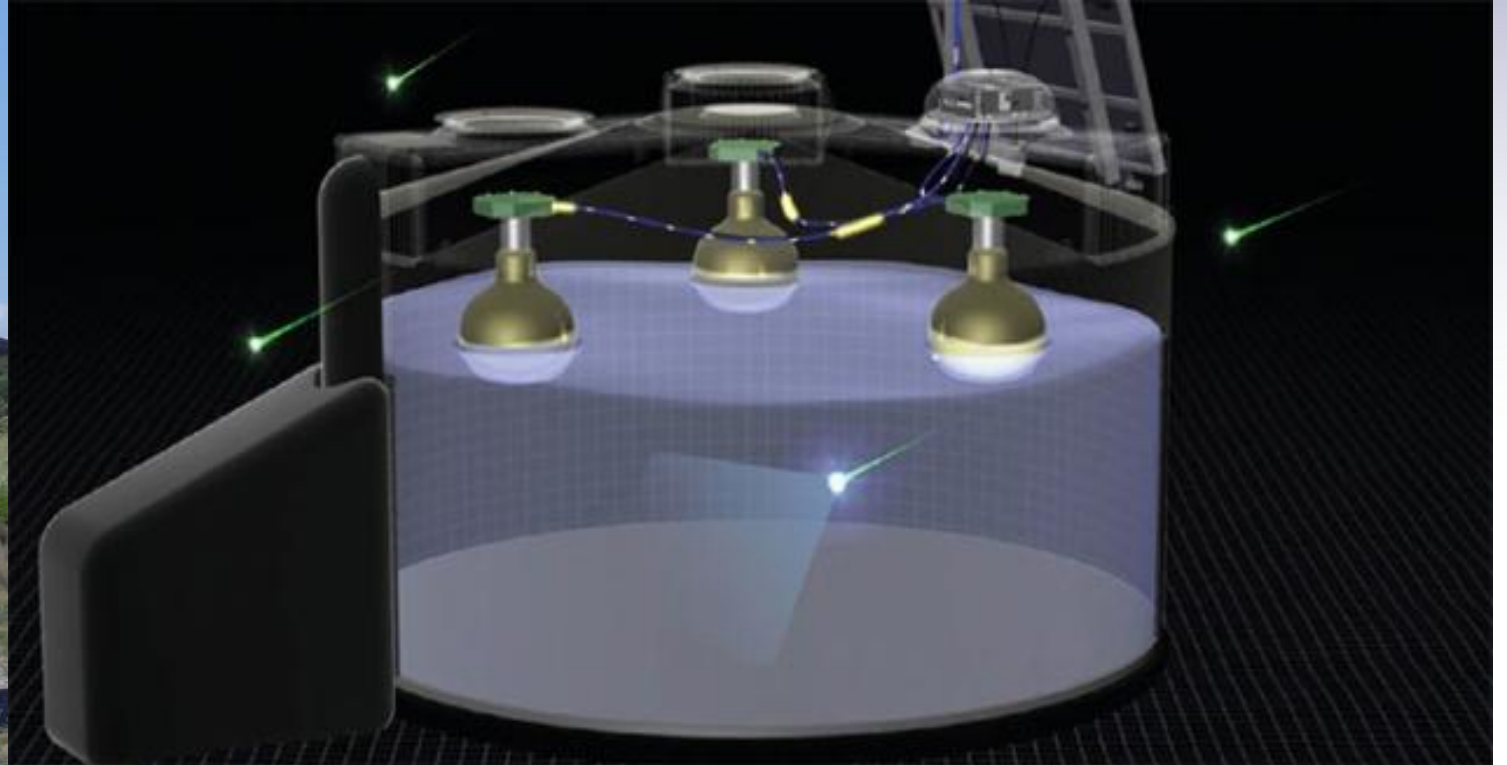
The Observatory



- set of fluorescence telescopes
- Cherenkov detector



The surface detector

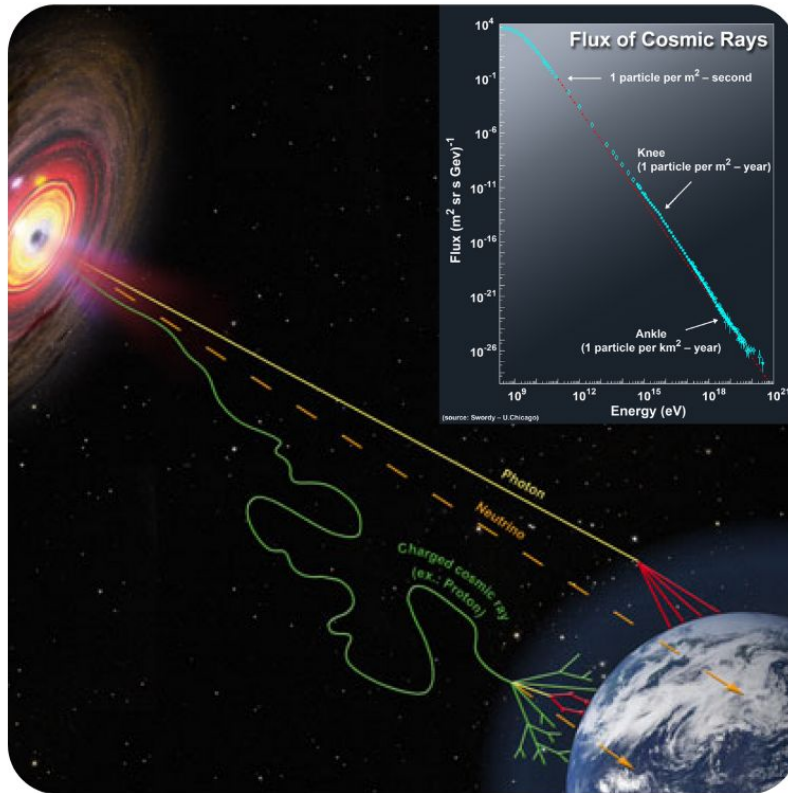


Left is the exterior of a WCD detector located at Pampa Amarilla. Right we see a representation of its interior: When the charged particle enters the water a Cherenkov light cone is produced, these photons are reflected by the detector walls and collected by the PMTs located symmetrically on the upper surface.



Main purpose

It was designed for the measurement of high energy cosmic rays:



Credit: HAP/A. Chantelauze

Two low-energy detection modes were subsequently implemented: *scaler* and *histogram* mode.



Superbossa.com, C. Righi

Gamma ray burst

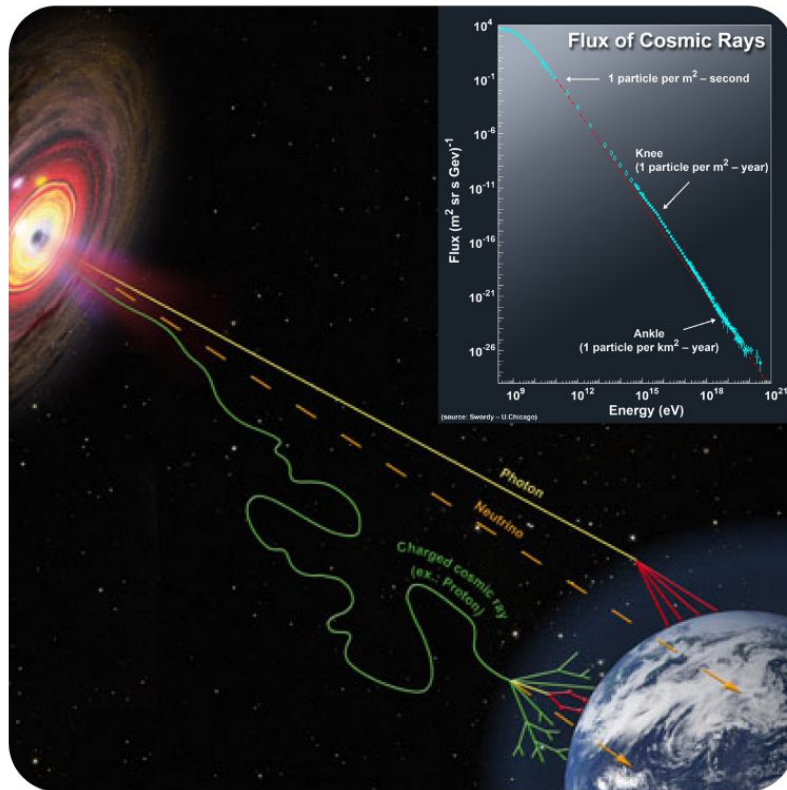


Space weather



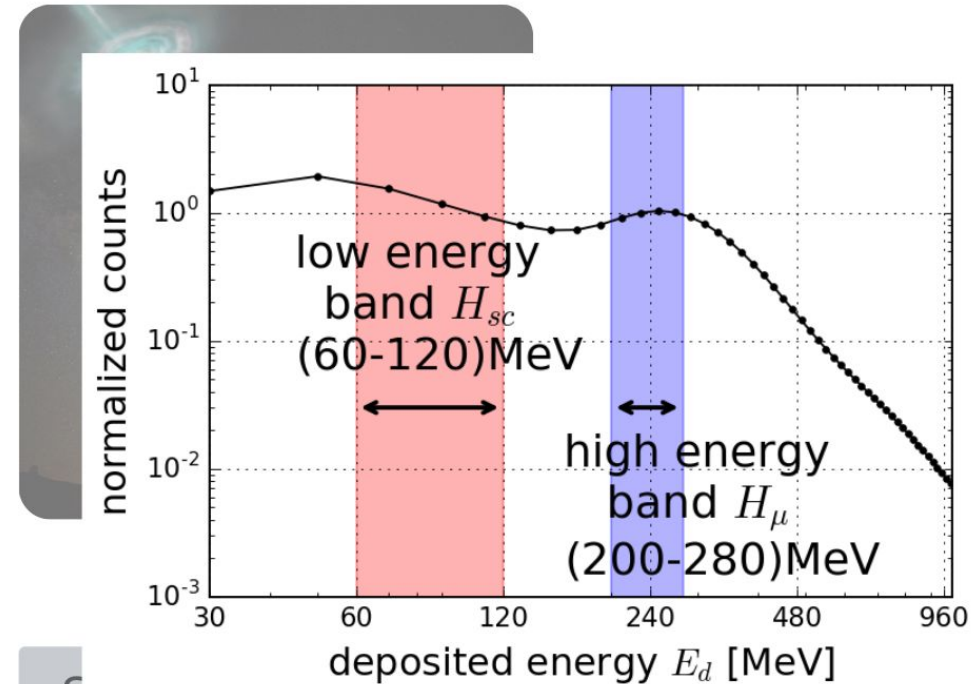
Main purpose

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Credit: HAP/A. Chantelauze

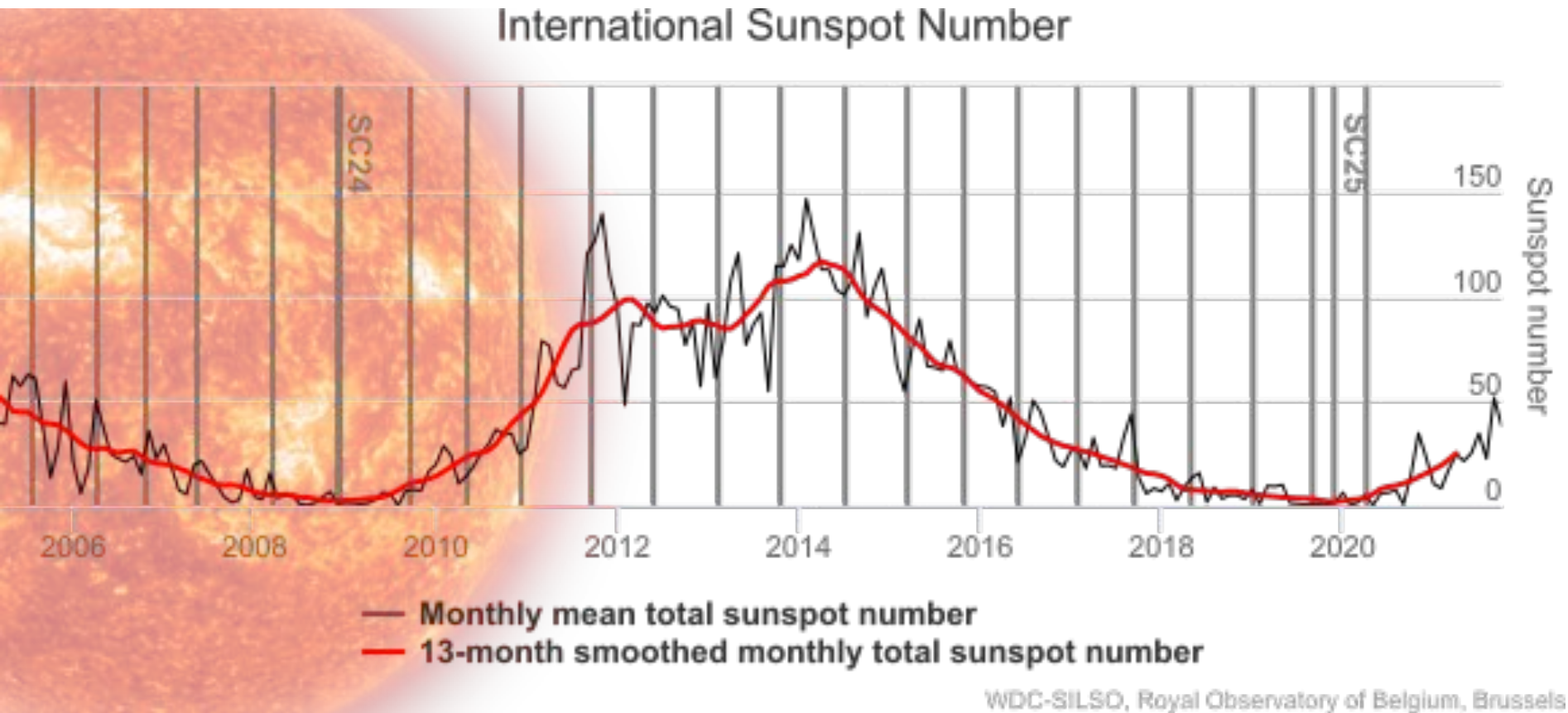
Two low-energy detection modes were subsequently implemented: *scaler* and *histogram* mode.



J. Macías, 2017



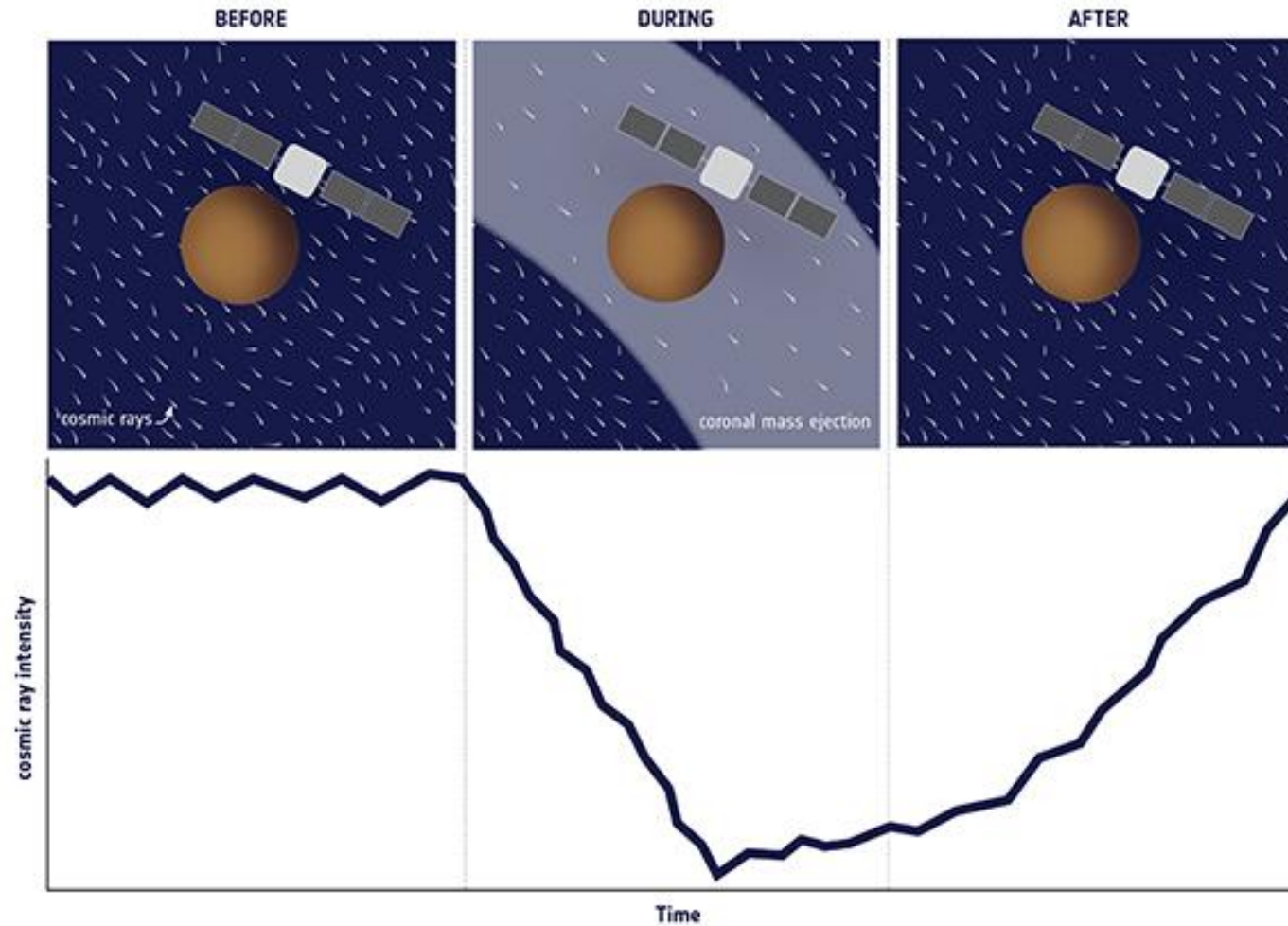
Specific objective



What is the observatory's ability to measure short- and long-term solar activity?



Solar modulation of GCR

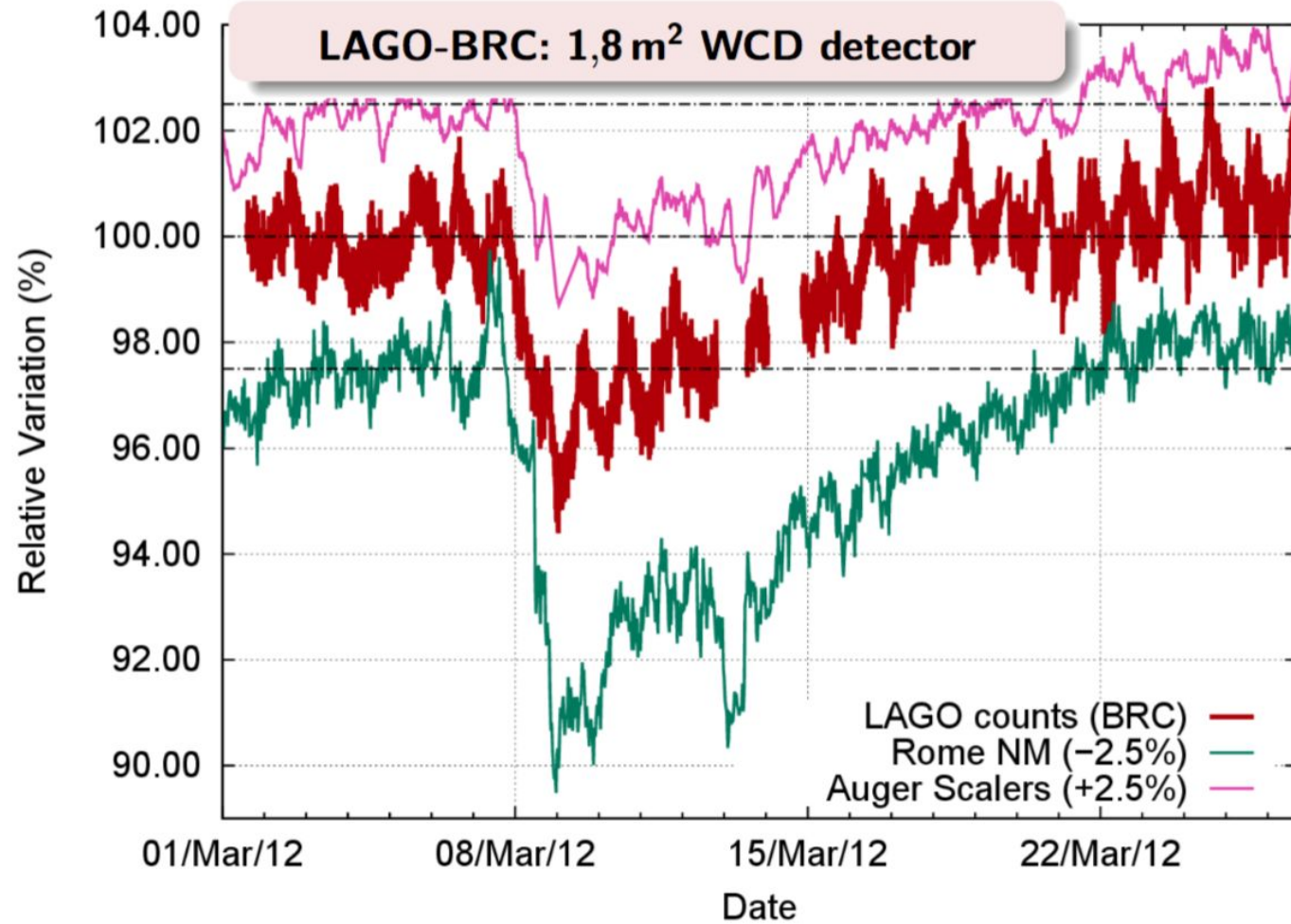


<http://sci.esa.int/solar-system/59399-tracking-a-solar-eruption-through-the-solar-system/>



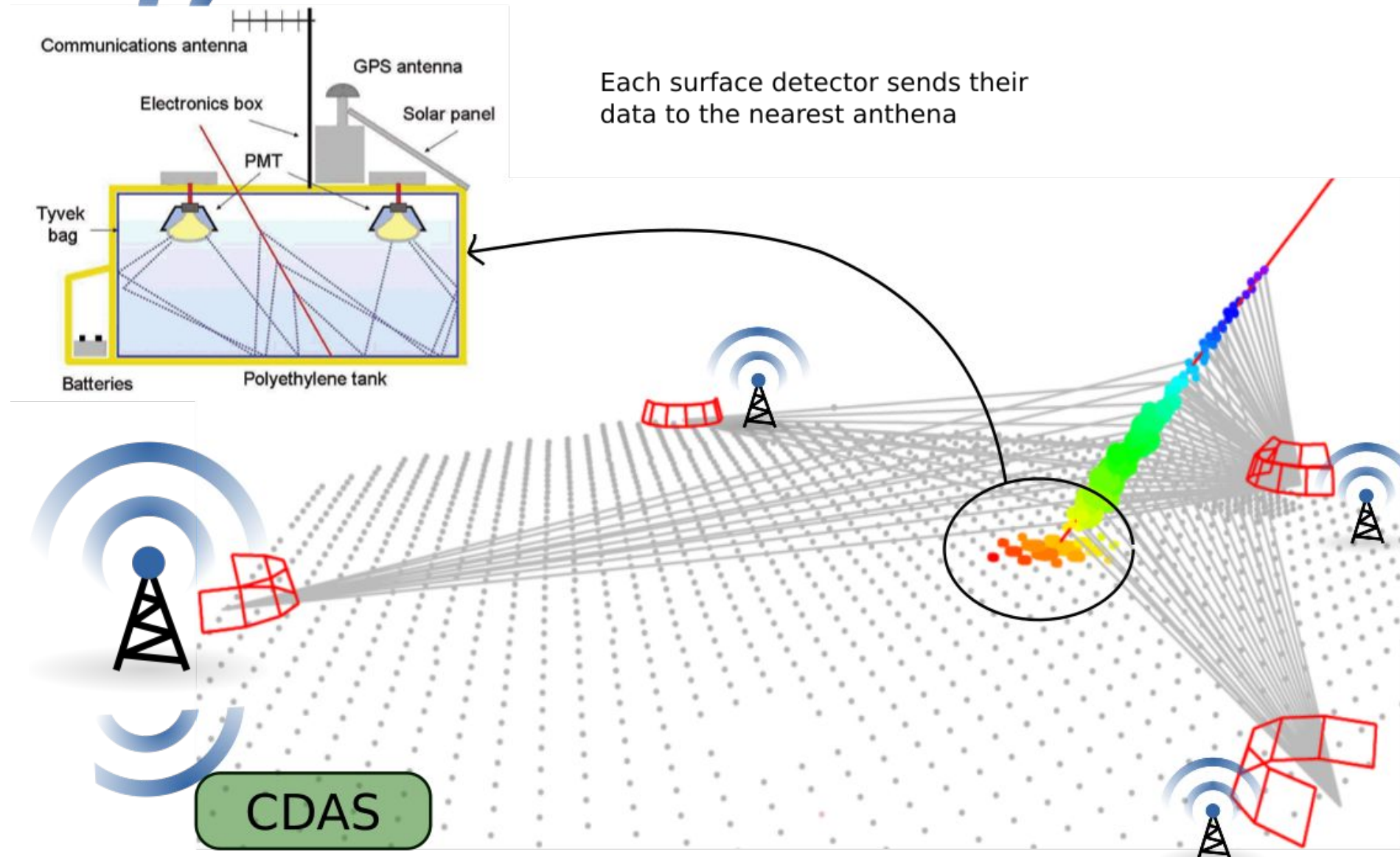
Solar modulation of GCR

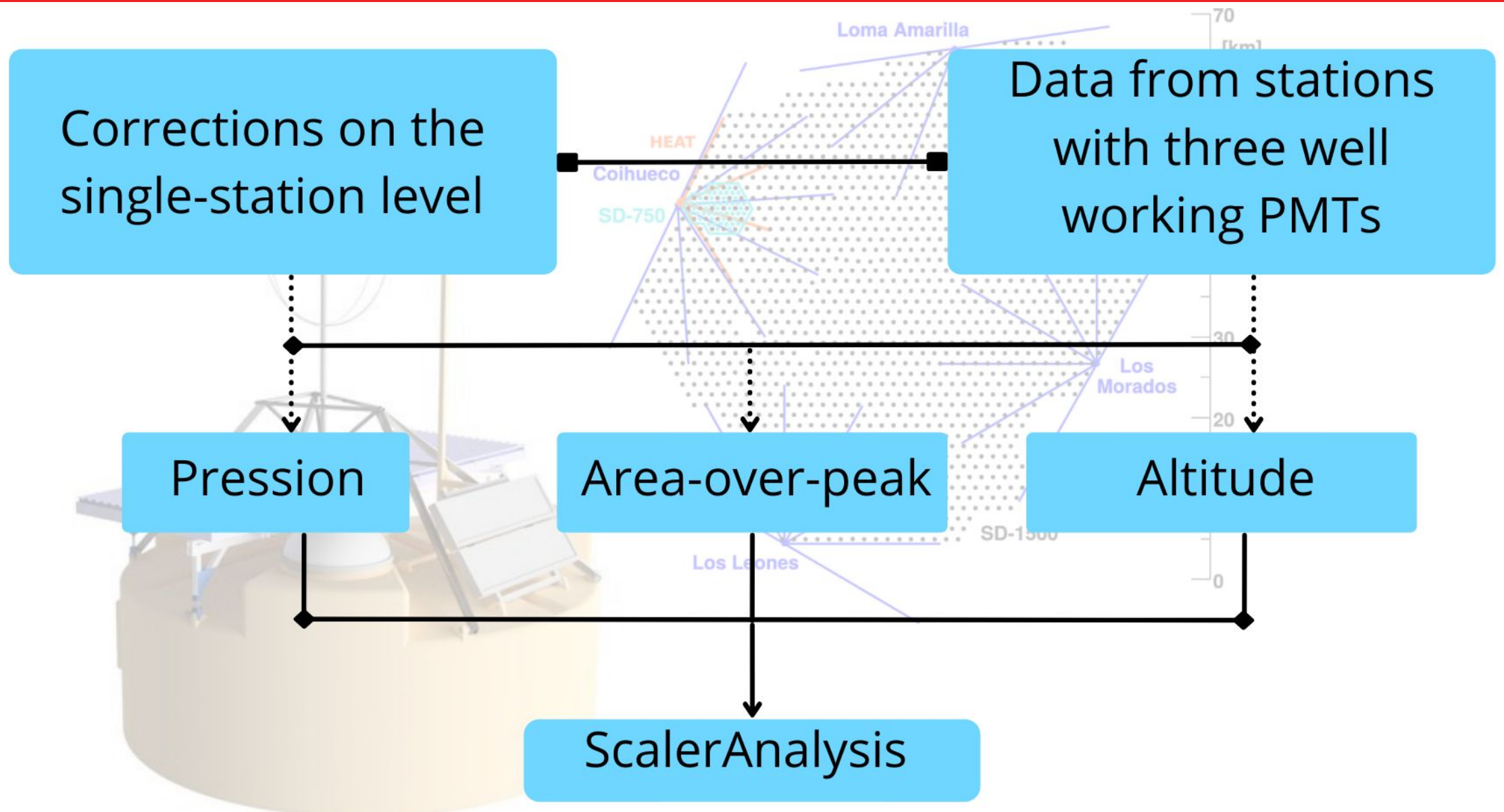
08/March/2012: Forbush event ← single LAGO detector





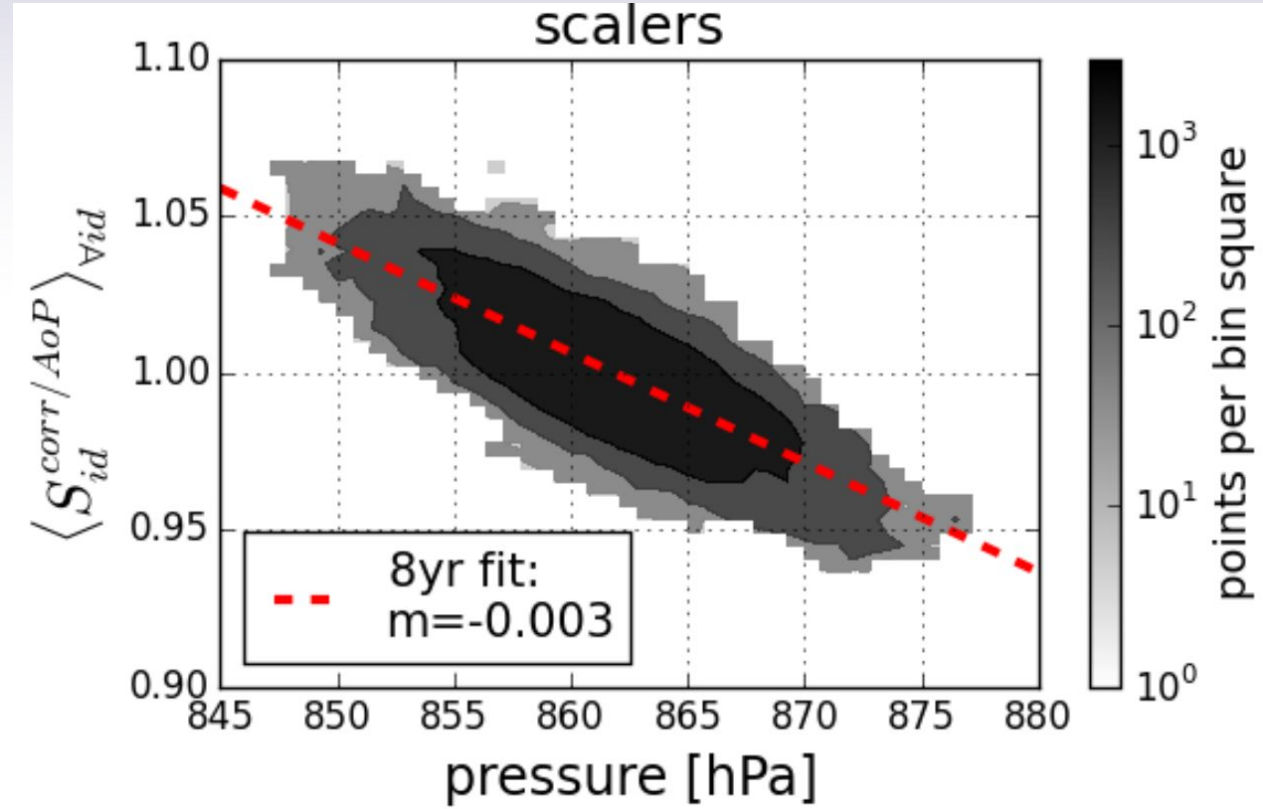
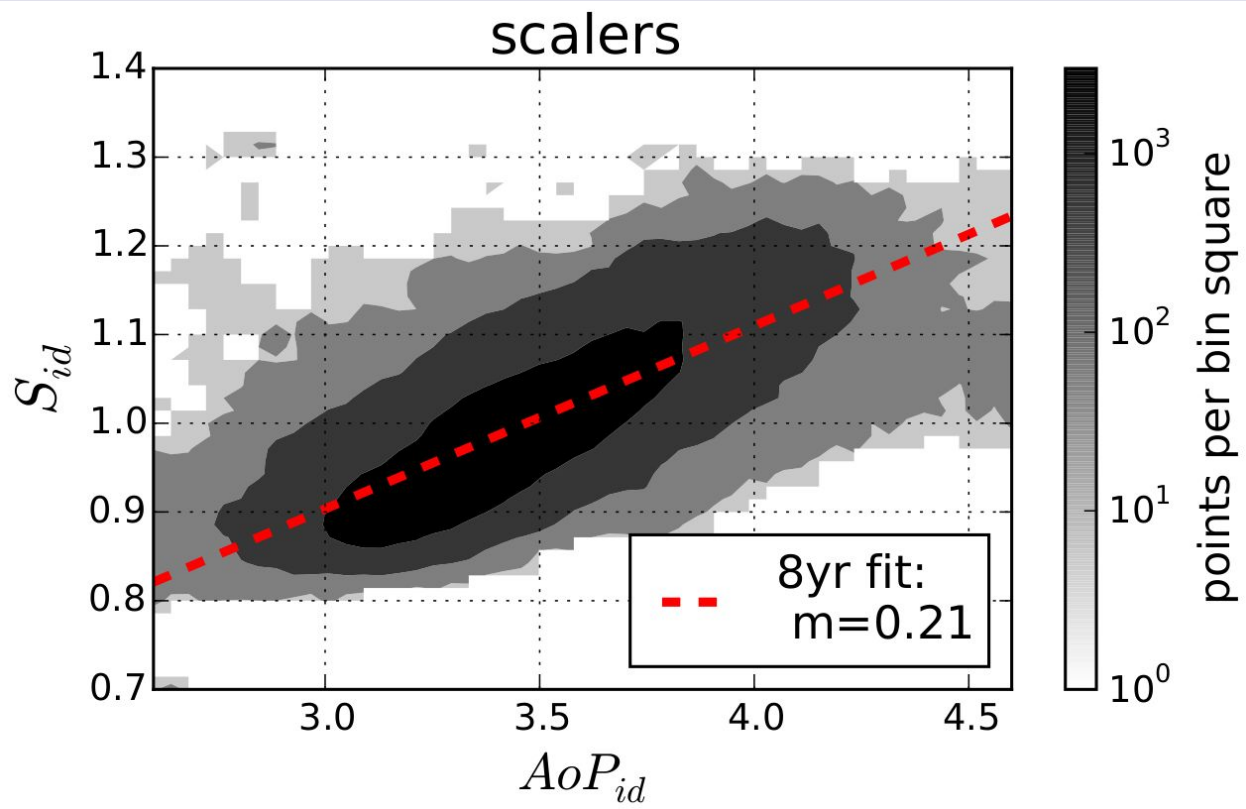
Data treatment





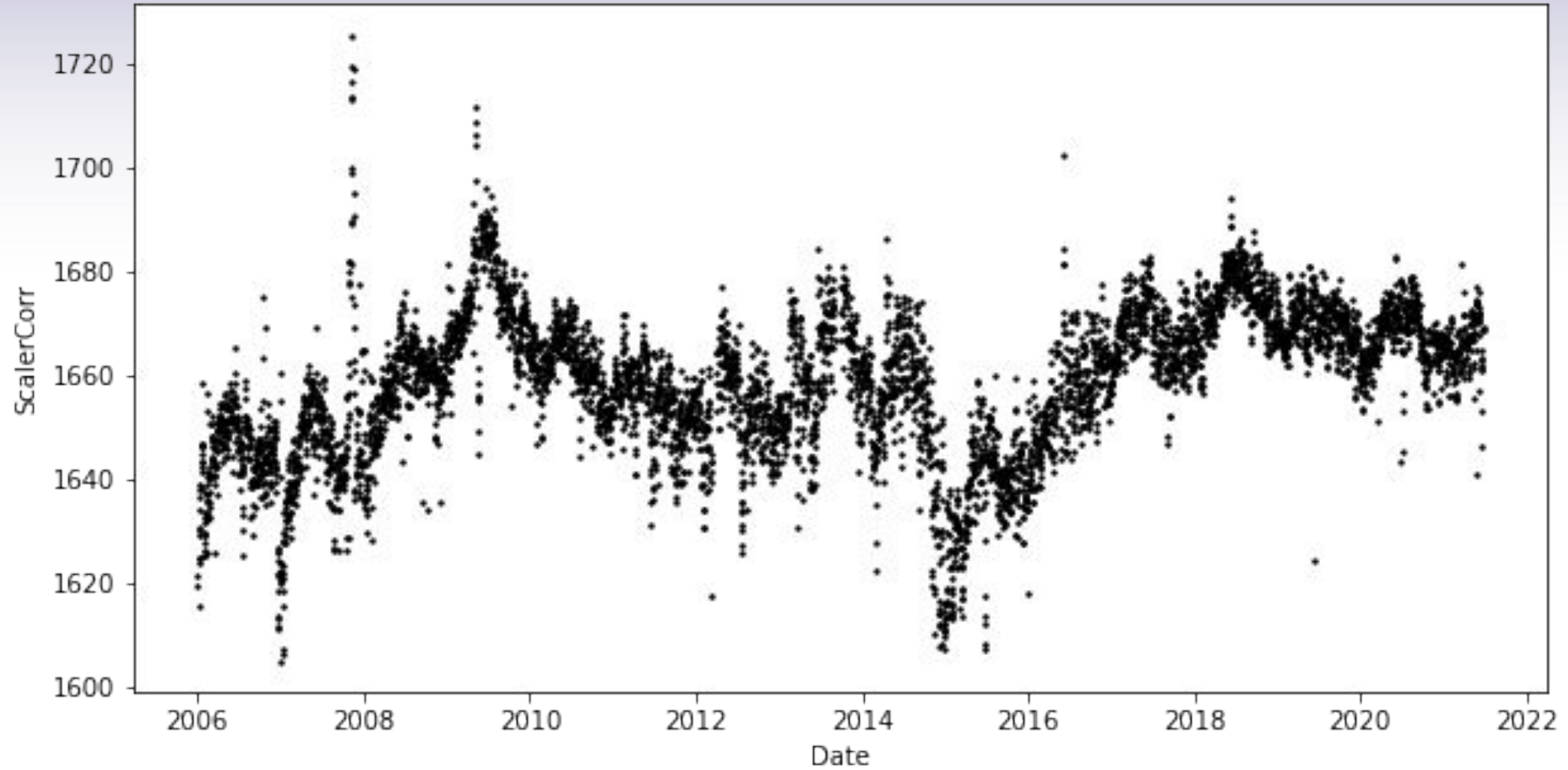


Data treatment



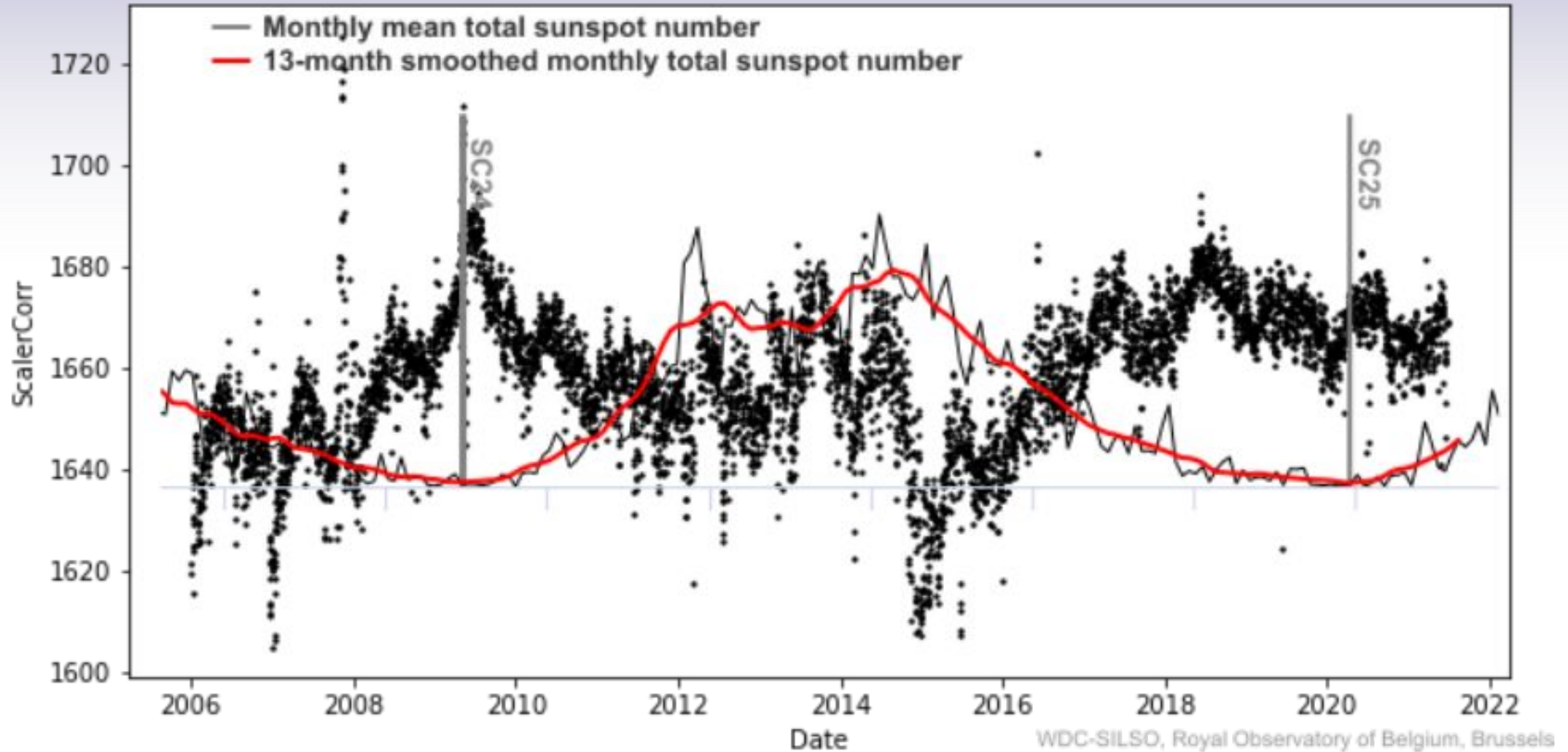


Preliminary results: 15 year corrected data



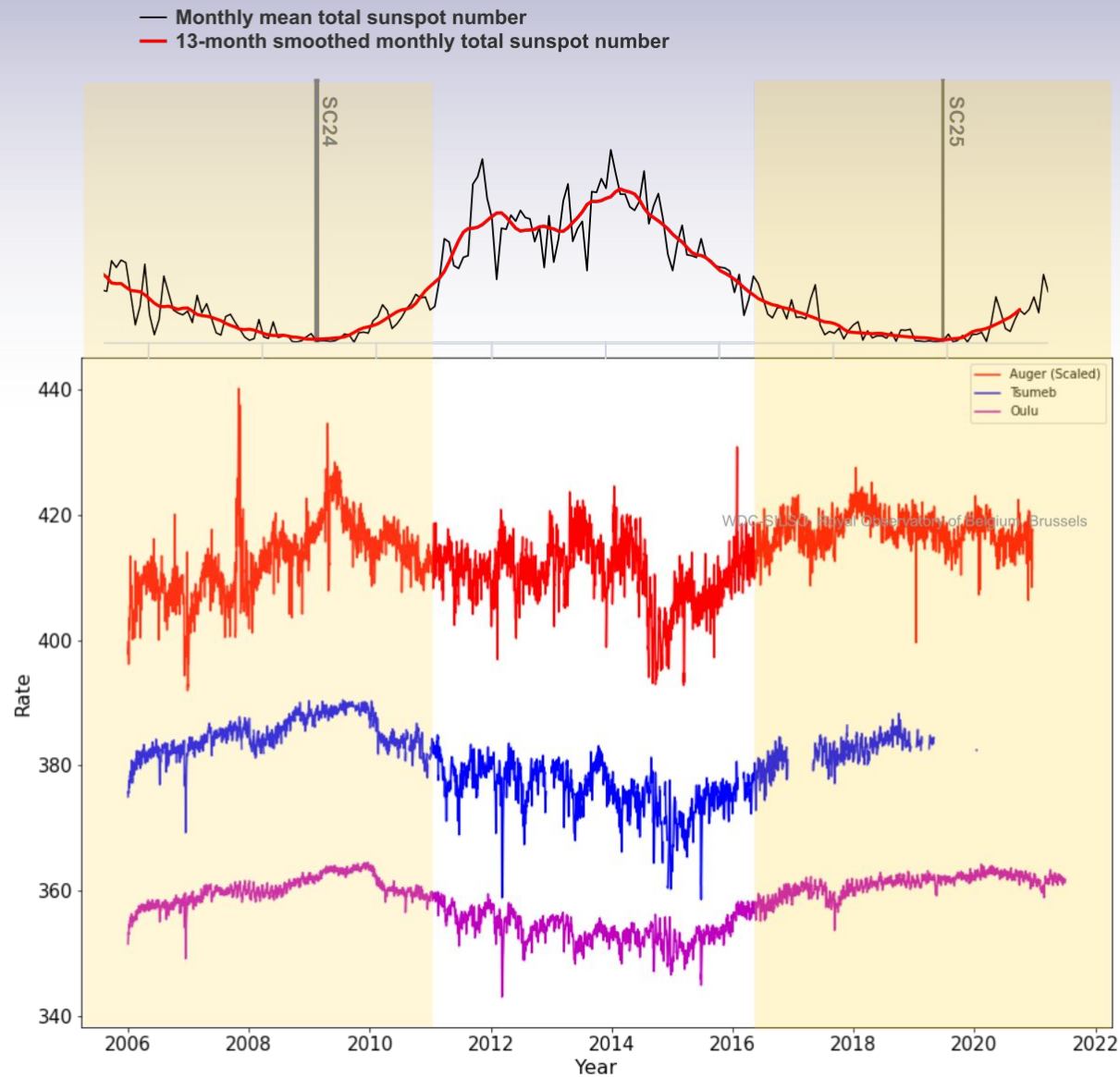


Preliminary results: Sunspots comparison



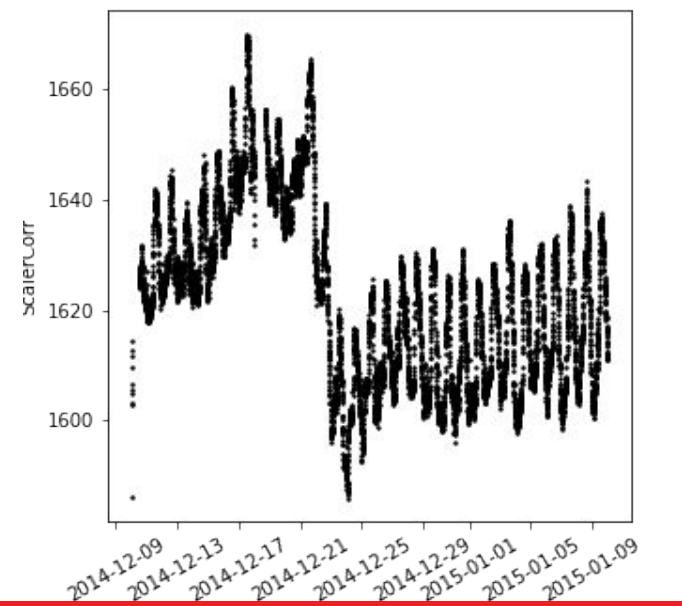
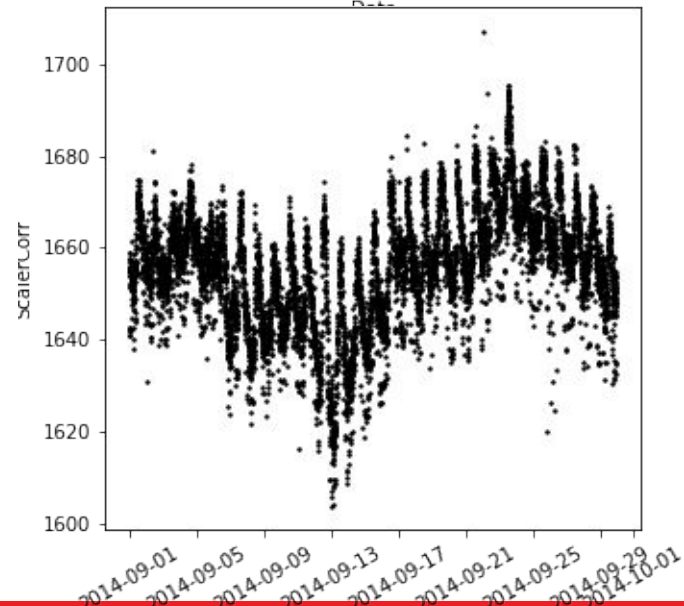
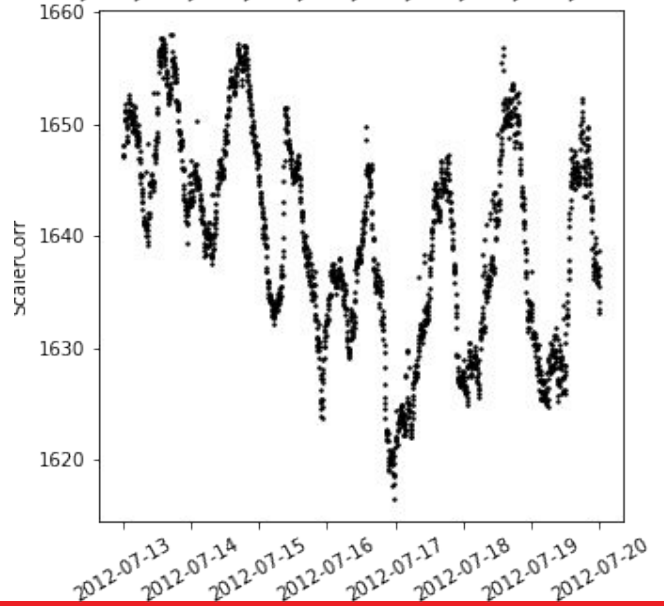
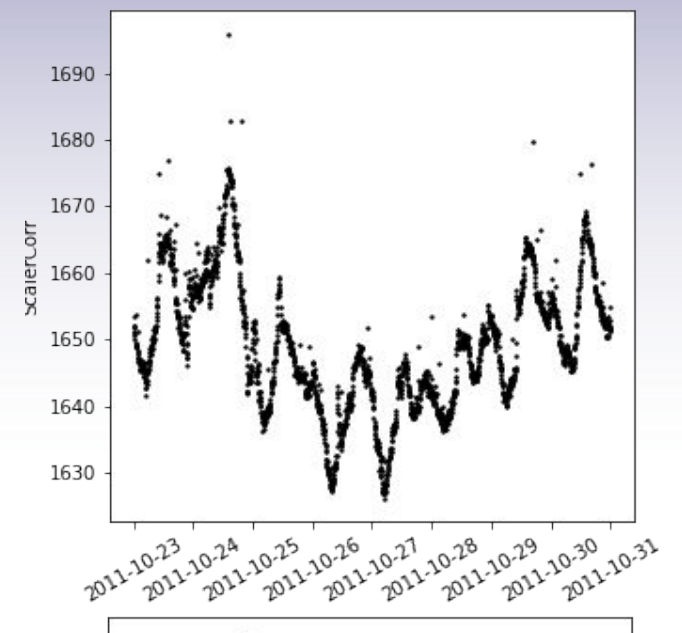
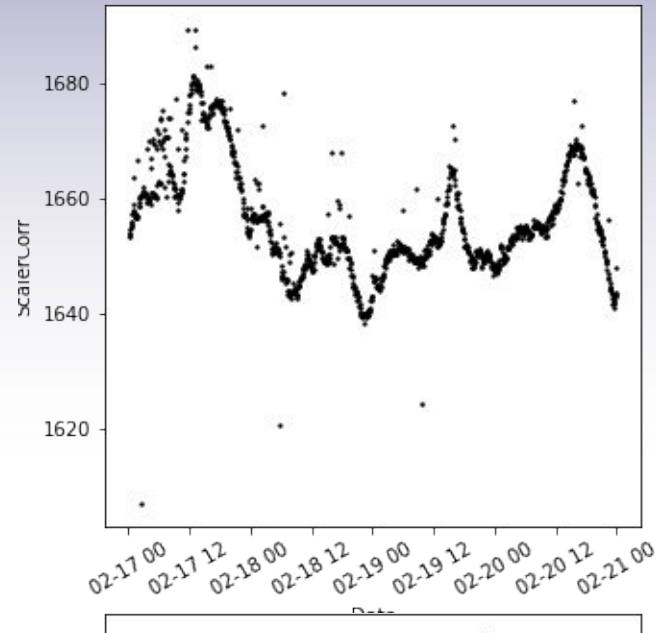
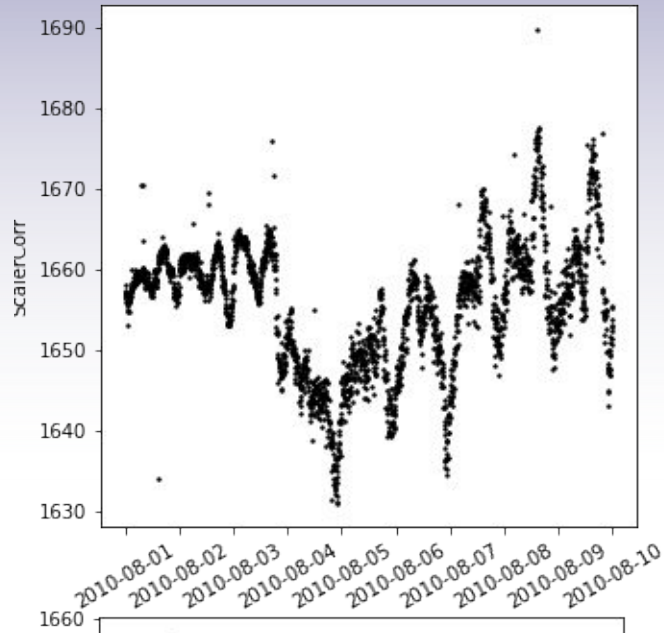


Preliminary results: Neutron monitor comparison



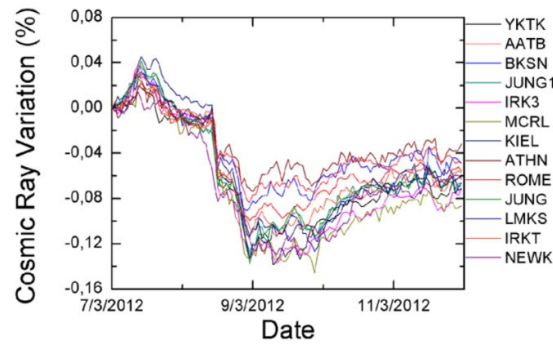
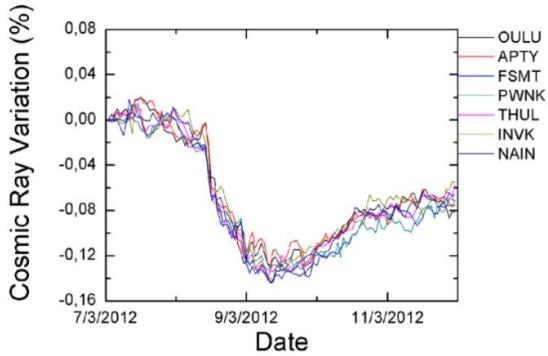
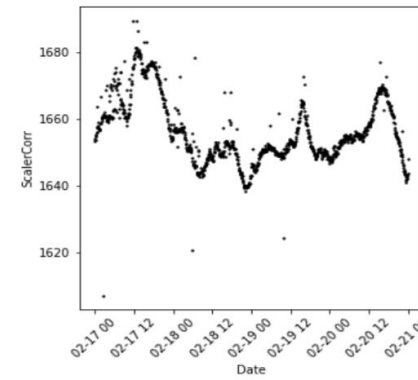
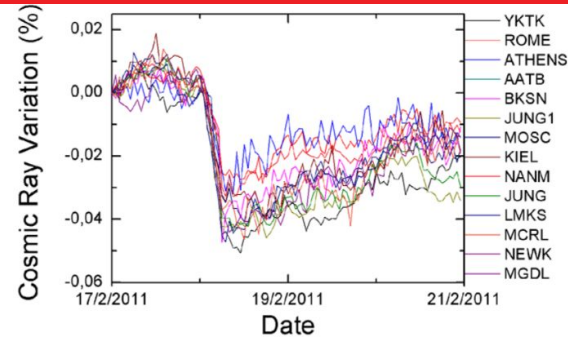
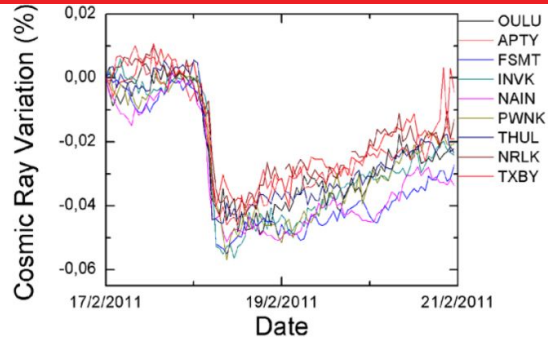


Preliminary results: Short term

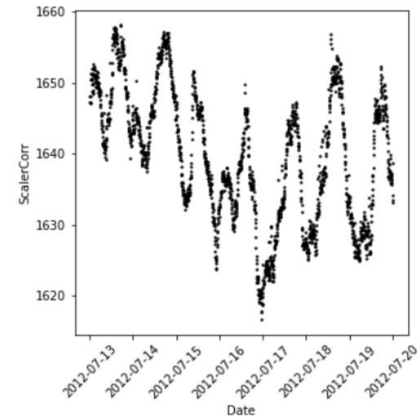
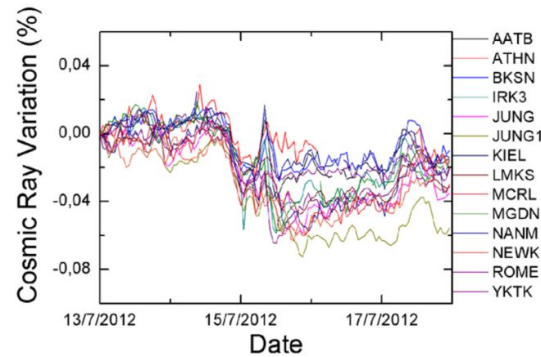
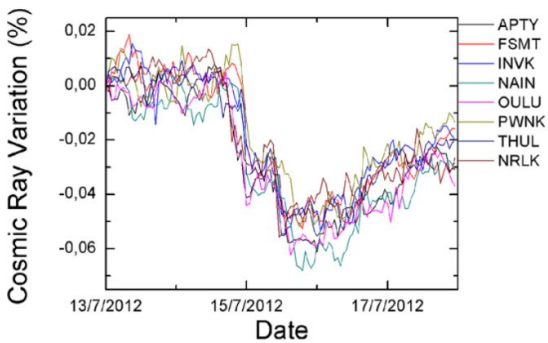




Preliminary results: Short term



NO DATA



Lingri, 2016



- The observatory is capable of measuring long-term solar activity.
- It is necessary to study much better the attenuation of the rate in the period of maximum solar activity.
- A thorough review of the characteristics of the data in this time period is needed.



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lacongaphysics



Latin American alliance for
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Preliminary results: Temperature correlation

