

Pleiades calibration over the La Crau calibration site

CEOS/IVOS24 – EROS data Center – Sioux Falls - May 2012



LaCrau site & ROSAS Robotic Station for Atmosphere and Surface

Photometer:

Based on CIMEL AERONET device design

Wheel wearing 9 filters: 380, 440, 550, 670, 740, 870, 937, 1020, 1600 nm

380 nm → atmospheric molecular scattering

740 nm → vegetation red edge

937 nm → water vapor

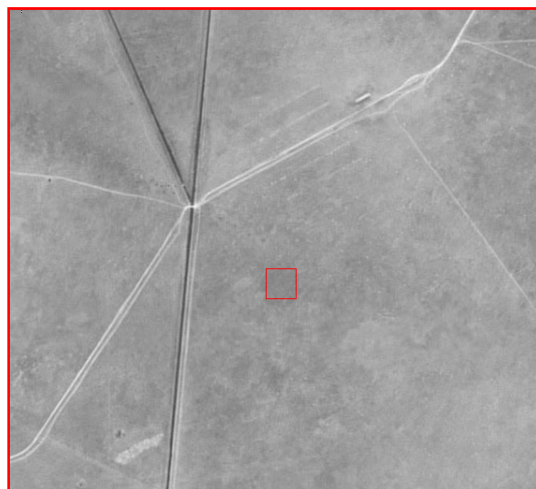
1020 nm → aerosols

Mounted on top of a post 10m high

Site:

LaCrau (South East of France)

Flat plain of 20 km diameter, covered with white pebbles and grass



First use of the site
in 1987 (SPOT1)

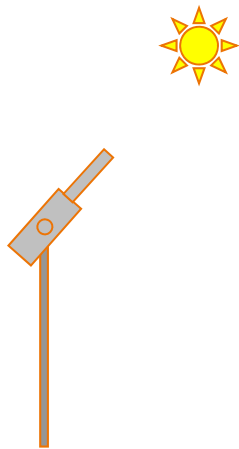
ROSAS since 1997



Measurement protocol

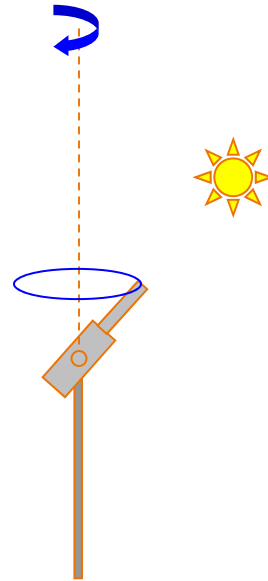
4 measurement scenarios are automatically performed:

Sun irradiance



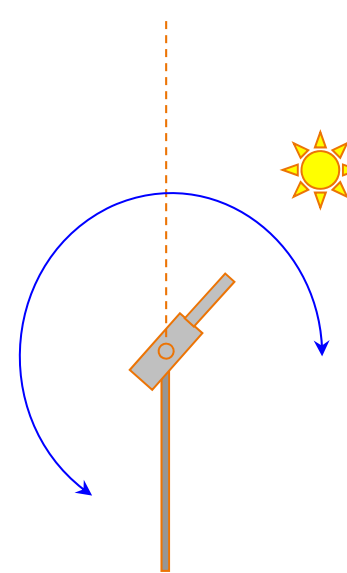
Irradiance measurements pointing the Sun in each band

Principal plane



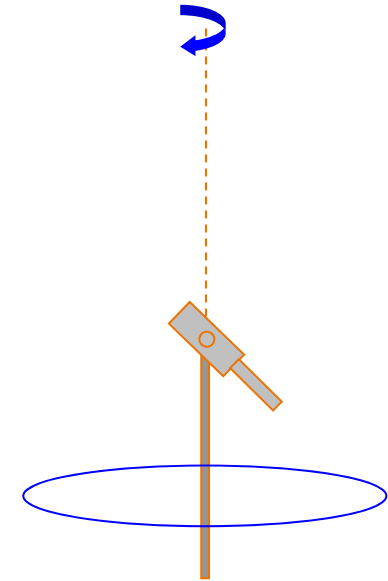
Sky radiances measurement in the vertical plane containing the Sun for 40 zenith observation angles for all bands except 937 nm

Almucantar



Sky radiances measurement according to 2 half cones around vertical axis for 30 azimuth observation angles for all bands except 937 nm

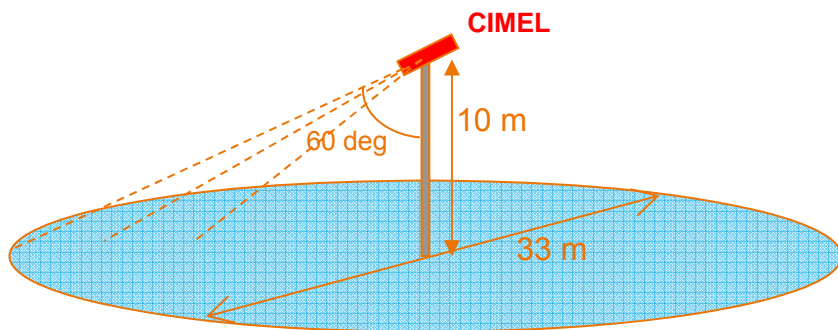
Ground



Sky radiances measurement in the vertical plane containing the Sun for 40 zenith observation angles for all bands except 937 nm

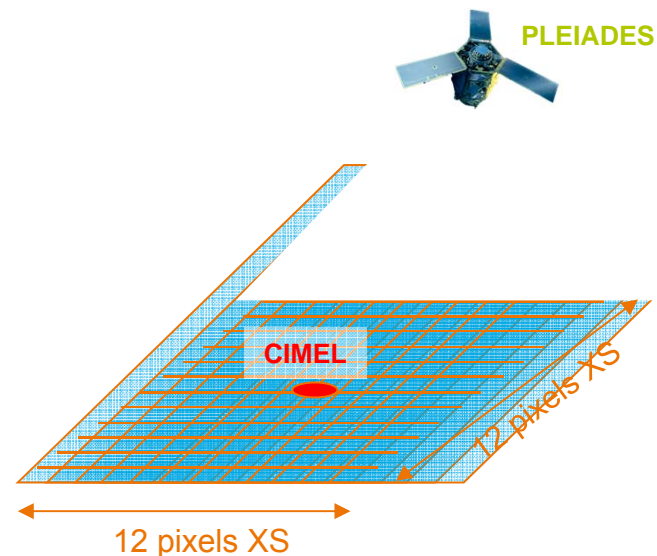
Acquisitions are performed only when the air mass is lower than 5. Complete set of data every 90mn:
SUN + ALM + PPL + GND (1st elevation) + SUN + GND (2nd elevation) + ... + GND (12th elevation) + SUN

Comparison of CIMEL and PLEIADES measurements



Ground measurement protocol

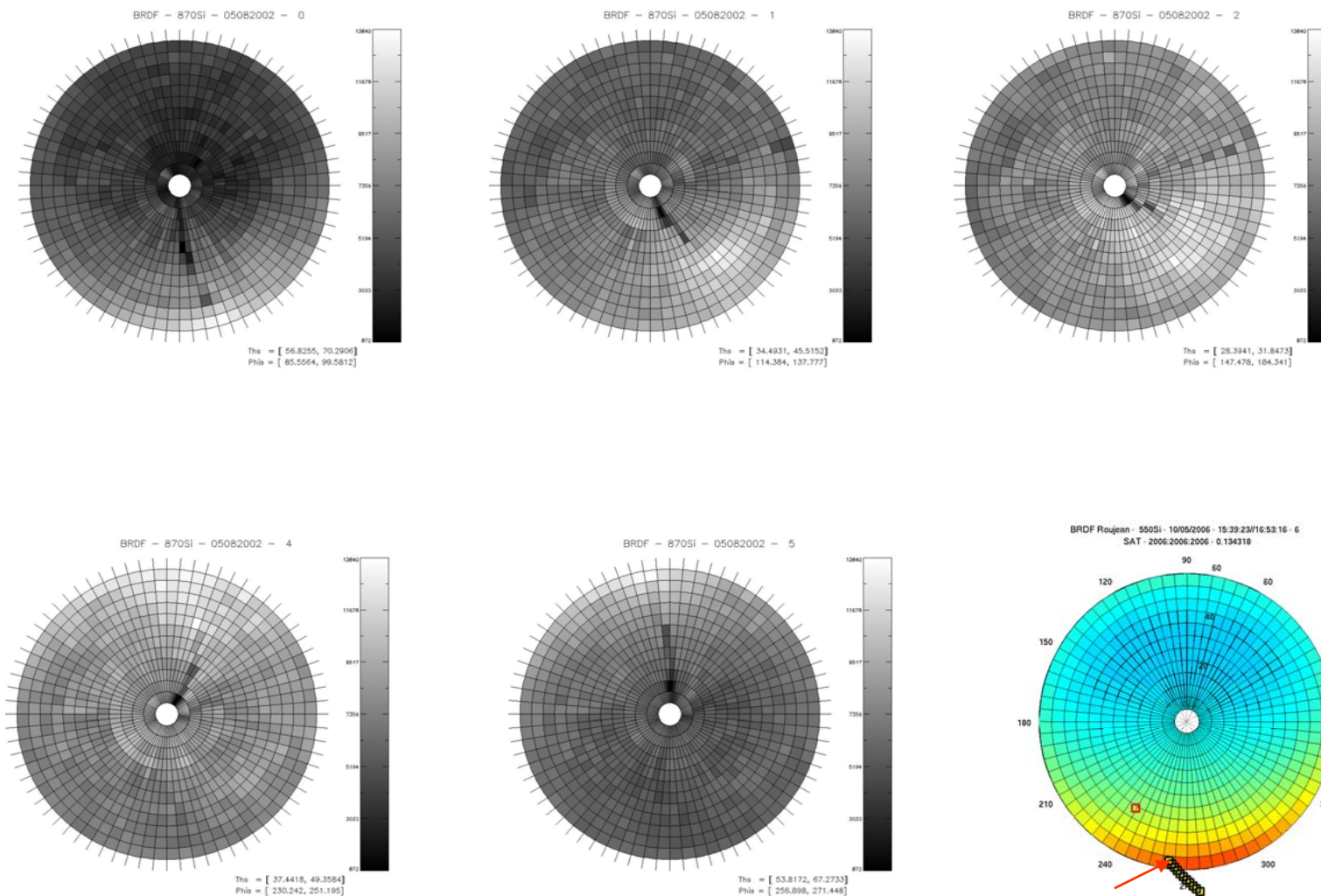
The Ground measurement protocol uses zenithal observation angles up to 60 degrees, which correspond to a 33m diameter circular zone.



PLEIADES Acquisitions over LaCrau site

Pleiades measurement is processed to a top-of-atmosphere reflectance and averaged over 12 XS pixels around the photometer i.e. a squared area of about 33m

Example of ROSAS surface measurements

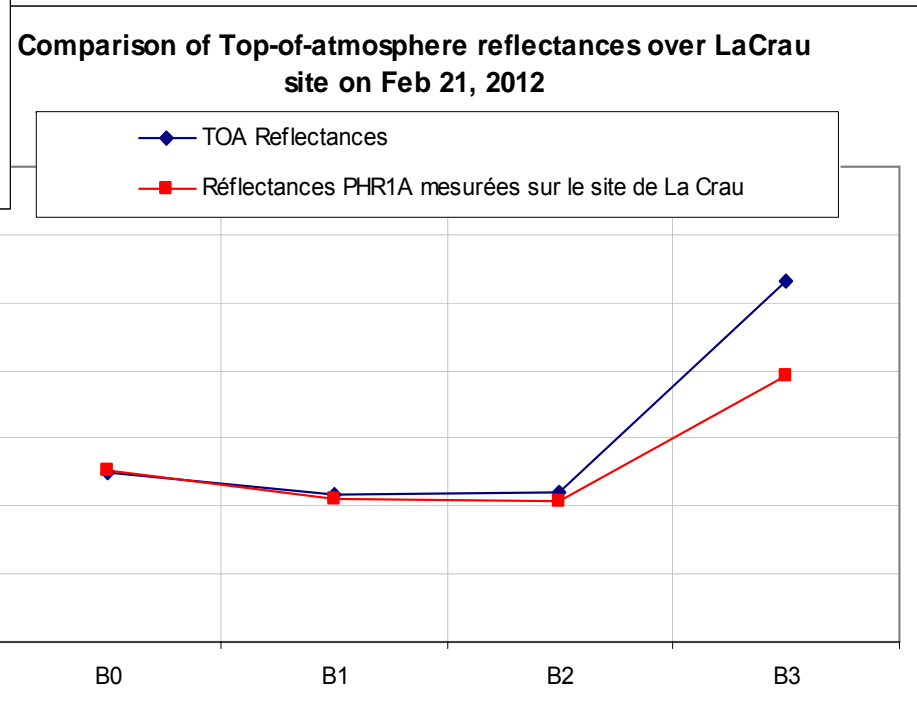
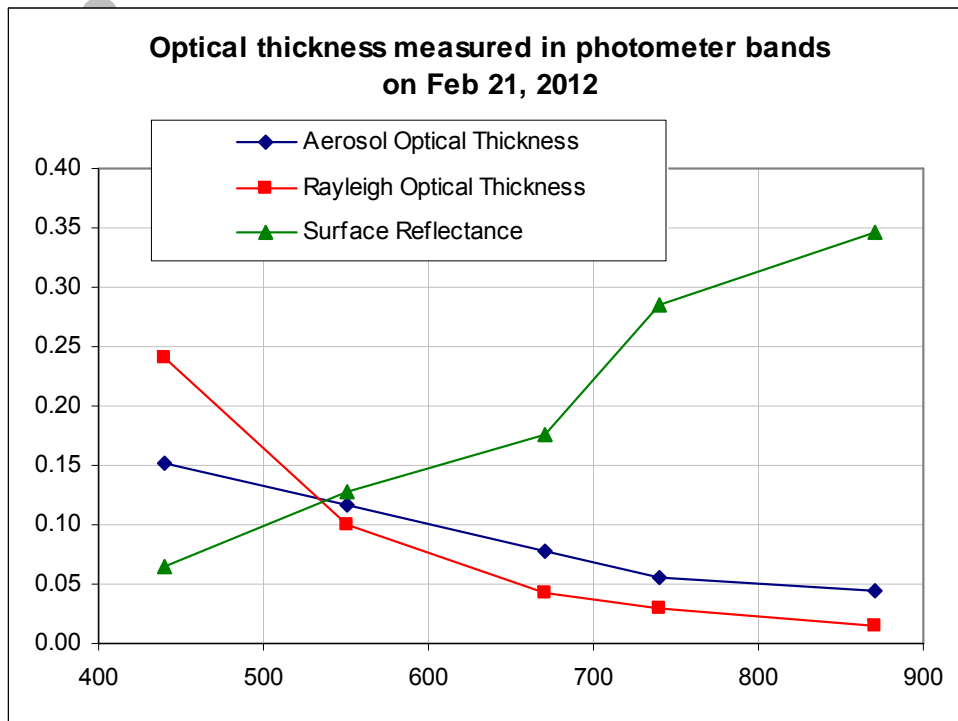


Hot spot

BRDF model (Rougean)
ajustement



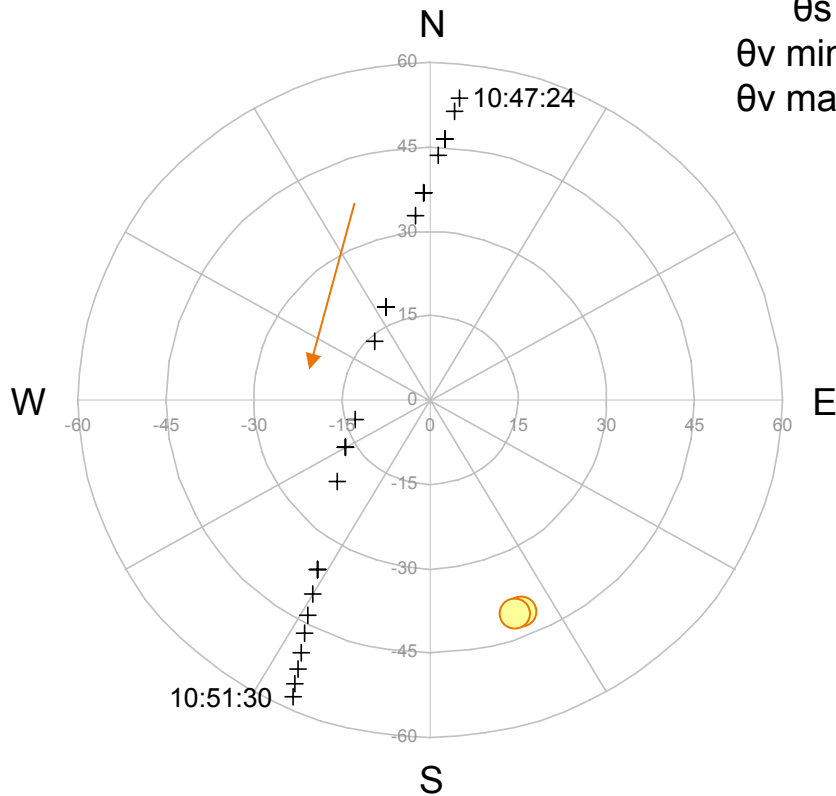
On-orbit PLEIADES calibration over LaCrau site: February 21, 2012



 **Preliminary results**

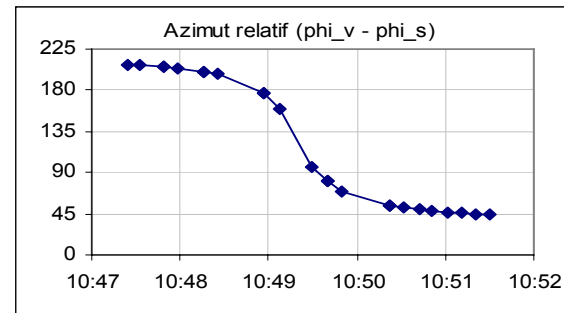
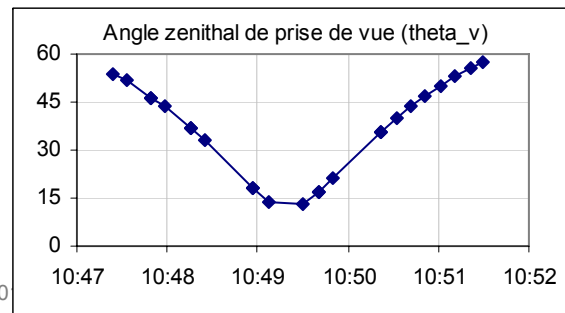
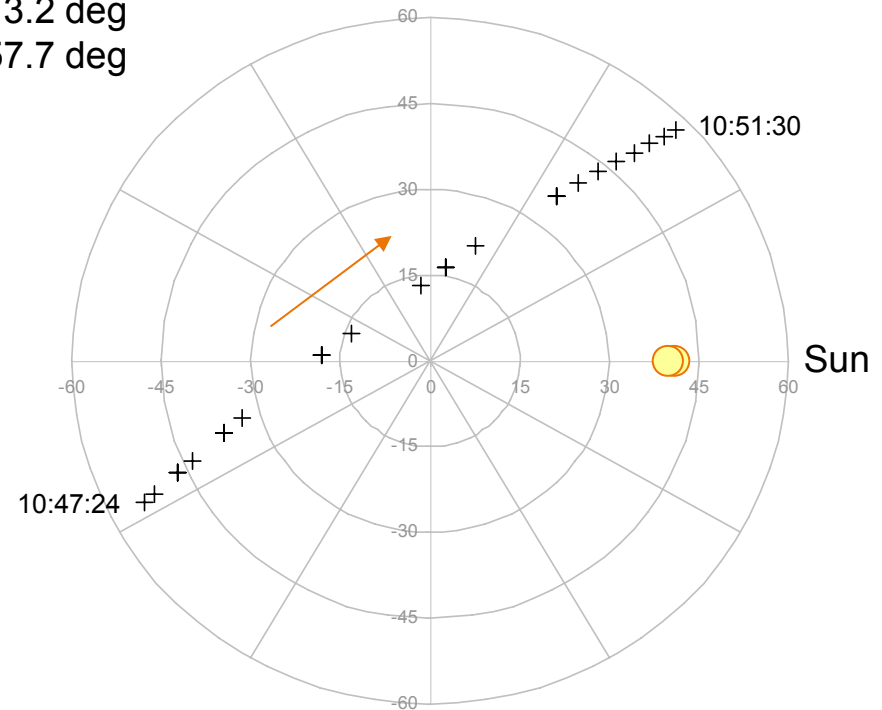
PLEIADES calibration over LaCrau site: March 28, 2012 'Video' acquisition

Absolute azimuth



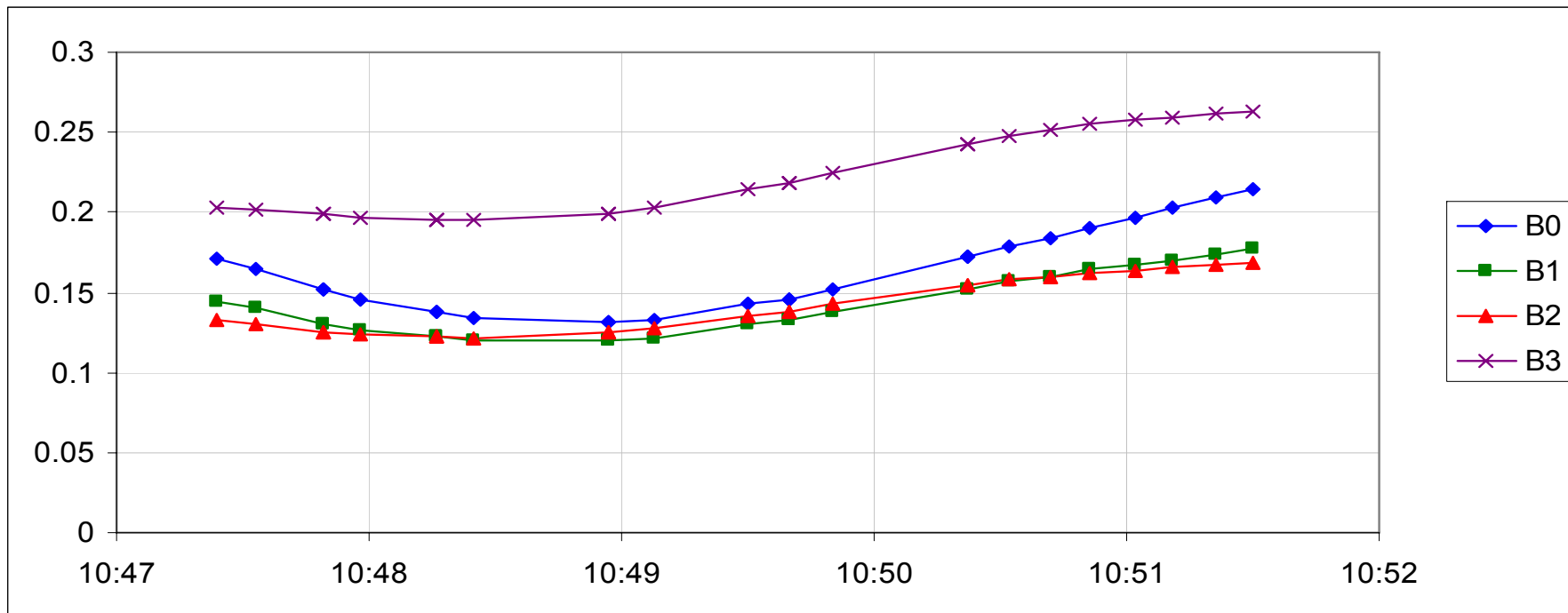
24 measurements
4 minutes total duration
 $\theta_s \approx 42$ deg
 $\theta_v \text{ min} = 13.2$ deg
 $\theta_v \text{ max} = 57.7$ deg

Relative azimuth

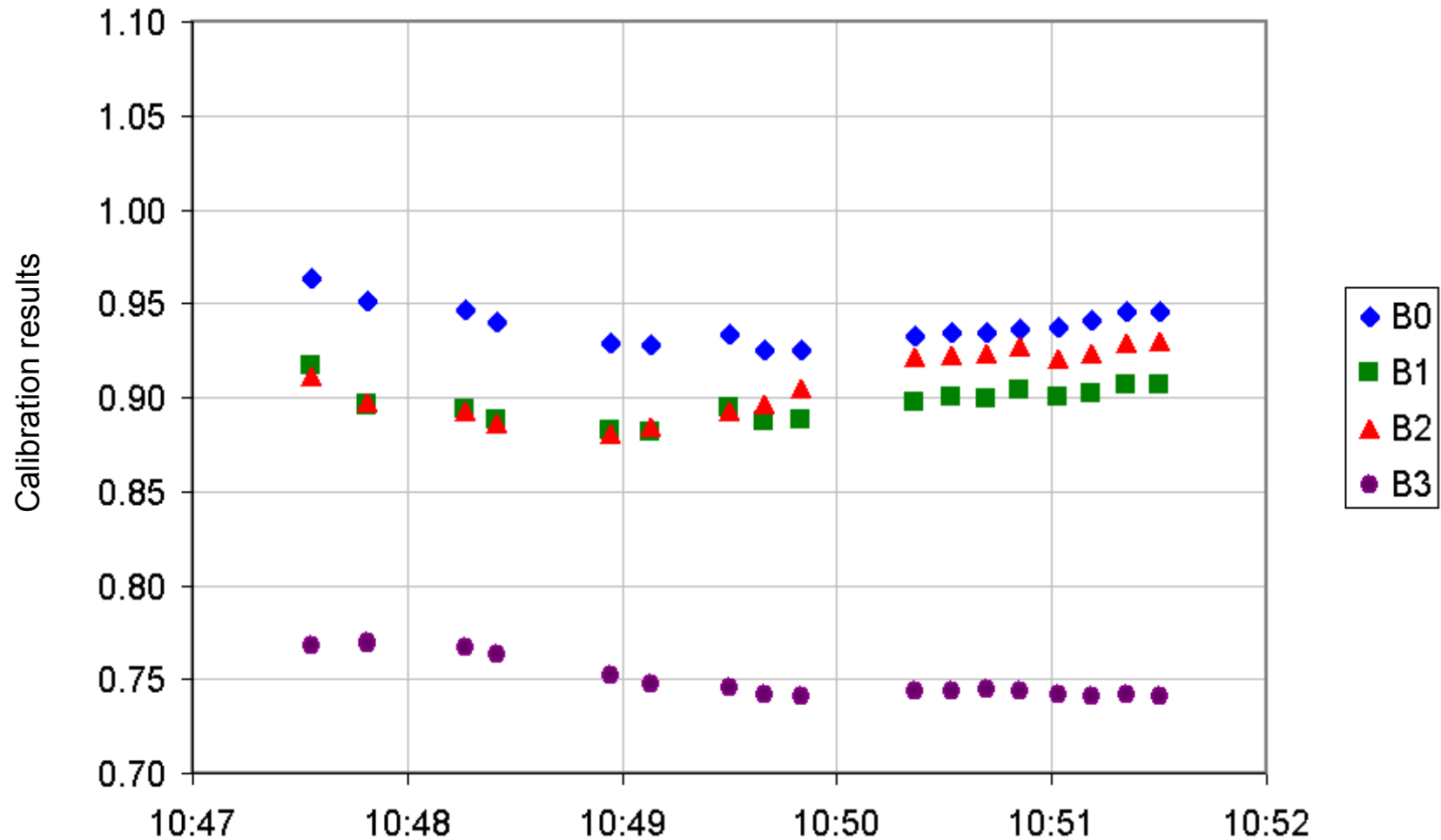


On-orbit PLEIADES calibration over LaCrau site: March 28, 2012

Top-of-atmosphere reflectance measured by PLEIADES on **March 28, 2012**
(applying before launch calibration)



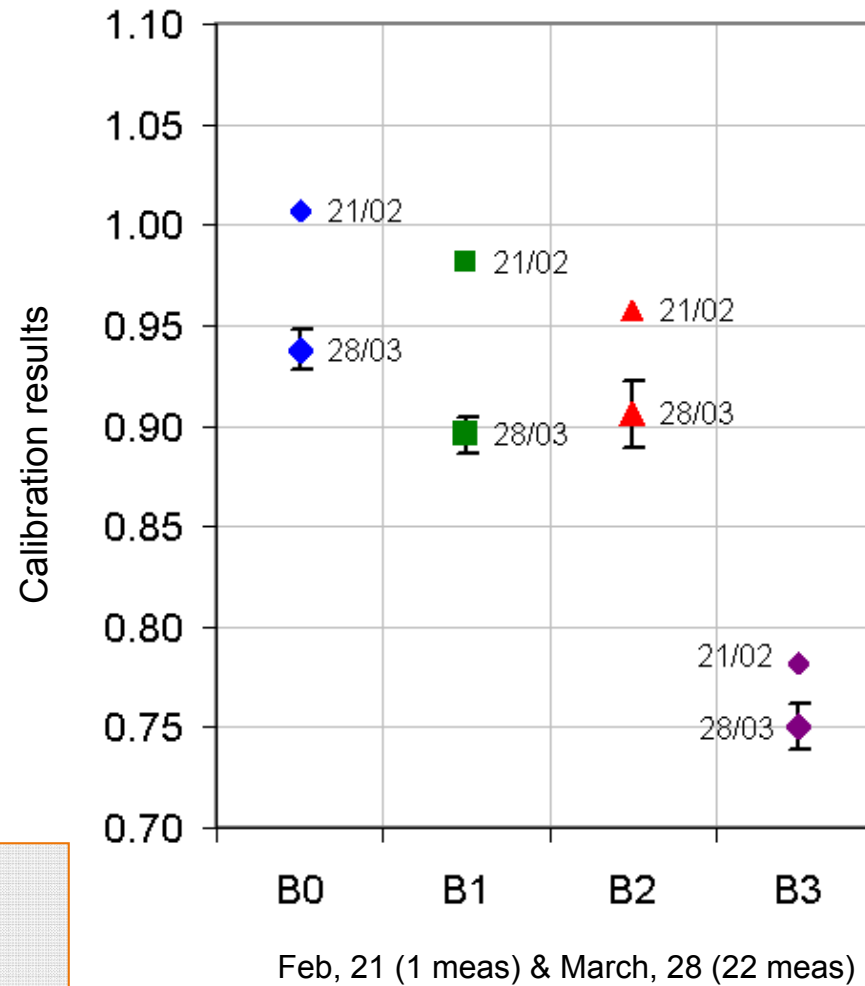
PLEIADES calibration over La Crau site: images of March 28, 2012



Preliminary results

PLEIADES calibration over La Crau site

Etalonnage PHR1A sur La Crau



 **Preliminary results**

PLEIADES calibration

See you end of June for the results of Pleiades in-flight commissioning

Final calibration (before routine monitoring...) synthesis:

- **La Crau / ROSAS**
- **Stable desert sites**
- **Rayleigh scattering calibration**
- **Dôme C**
- **Moon calibration**
- **Stars calibration (?)**