Geophysical Research Abstracts
Vol. 18, EGU2016-6568, 2016
EGU General Assembly 2016

HDRF (Hemispherical-Directional Reflectance Factor) measurements for the characterisation of a new autonomous instrumented radiometric calibration site: Gobabeb, Namib Desert.

Maxim Lamare (1,2), Agnieszka Bialek (2), Claire Greenwell (2), Emma Woolliams (2), Martin King (1), and Nigel Fox (2)

(1) Department of Earth Sciences, Royal Holloway University of London, Egham, UK, (2) Earth Observation, Climate and Optical Group, National Physical Laboratory, Teddington, UK

In Autumn 2015, NPL (National Physical Laboratory) and CNES (Centre National d'Etudes Spatiales) performed a characterisation of a new permanently instrumented radiometric calibration site for high and medium resolution imaging satellite sensors under development in the Namib Desert, to provide a detailed assessment of the site's radiometric properties.

Nadir surface reflectance measurements were performed using ASD FieldSpec portable spectroradiometers and reflectance at different viewing angles was obtained with GRASS, the Gonio RAdiometric Spectrometer System developed at NPL. GRASS is designed to record ground-based HDRF (hemispherical directional reflectance factor), by performing hyper-spectral measurements of reflectance of a single target, from individual signal collectors mounted on a hemispherical frame. The signal collectors, which have an 8º full cone of acceptance, are connected to a V-SWIR spectroradiometer (400 – 1700 nm) through fibre optics.

HDRF measurements were performed at 9 different sites in two locations that were selected in the first stage of the project based on pre-determined objective criteria. Multiple daily measurements allowed to obtain HDRF datasets for a range of different solar zenith angles and were timed to correspond to key satellite overpasses (Sentinel 2A MSI and Landsat 8 OLI). The multi angular reflectance measurements from GRASS will provide information on the representativeness of the permanent automated instrument that will be installed, allowing the calibration of satellites sensors measuring the site at different viewing zenith angles.

The development of the site is part of a collaborative project between ESA (European Space Agency) and CNES, in conjunction with NPL. The site will become part of the global distributed network of reference sites belonging to the RadCalNet initiative (Radiometric Calibration Network using automated instruments) established by the CEOS (Committee on Earth Observation Satellites).