Algodones Dunes characterization campaign 2015

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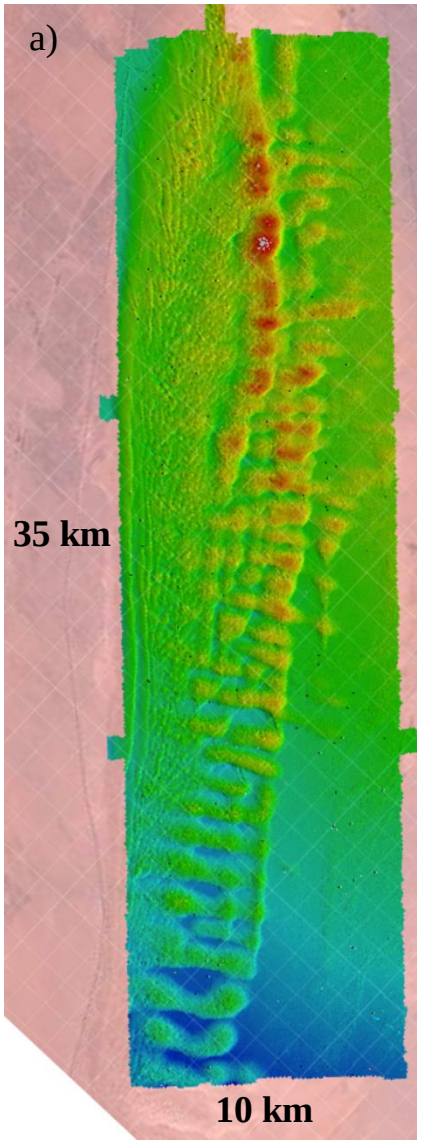

Inter-calibration of Earth-observing sensors is improved with physical models of pseudo-invariant test sites supported by field observations. This ground and airborne campaign coincident with satellite observations took place in southern California and brought together international research groups for a comprehensive characterization of spectral reflectance, BRDF, and topography.

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References:

McCorkel, J., et al, “Characterization of Algodones Dunes with airborne measurements for satellite cross-calibration,” IGARSS, in prep, 2015.

Data Sources: Reflectance data is derived from a portable version of the reflected solar instrument of the Climate Absolute Radiance and Refractivity Observatory (CLARREO) that was designed, built, and characterized at GSFC. Airborne data is from the Goddard Lidar, Hyperspectral and Thermal (G-LiHT) observation platform. BRDF and physical sampling is from Rochester Institute of Technology and University of Lethbridge.

Technical Description of Figures:

Graphic a: Digital elevation model of Algodones Dunes derived from Lidar measurements from G-LiHT.

Graphic b: Reflectance measurements of canvas calibration tarps using a portable version of the CLARREO imaging spectrometer. The tarps are targets for the G-LiHT imaging spectrometer.

Graphic c: The Goniometer at the University of Rochester (GRIT) taking measurements of a reference target as G-LiHT flies over.

Scientific significance, societal relevance, and relationships to future missions:

A field campaign was held at Algodones Dunes in southern California during March 8-14, 2015. The purpose of the campaign is to characterize the test site to build accurate models for improved satellite sensor inter-calibration and test calibration transfer techniques between laboratory, field and airborne instruments. Primary parameters of the test site characterized in this work are spectral reflectance, BRDF, and spatial variability. Due to the stability of the dunes, these data provide a link to historical satellite measurements so that the calibration of current and future sensors can be transferred back in time. More immediately, this research directly benefits Sustainable Land Imaging since it will be used to bridge data of Sentinel 2 with the gold-standard calibration of the Landsat 7 and Landsat 8 sensors.