

Using Dome C for moderate resolution imaging spectroradiometer calibration stability and consistency

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Abstract. Currently, there are two nearly identical moderate resolution imaging spectroradiometer (MODIS) instruments operated in space: one on the Terra spacecraft launched in December 1999 and another on the Aqua spacecraft launched in May 2002. MODIS has 36 spectral bands with wavelengths covering from visible (VIS) to long-wave infrared (LWIR). Since launch, MODIS observations and data products have significantly enabled studies of changes in the Earth system of land, oceans, and atmosphere. In order to maintain its on-orbit calibration and data product quality, MODIS was built with a comprehensive set of on-board calibrators. MODIS reflective solar bands (RSB) are calibrated on-orbit by a system that consists of a solar diffuser (SD) and a solar diffuser stability monitor (SDSM) on a regular basis. Its thermal emissive bands (TEB) calibration is executed on a scan-by-scan basis using an on-board blackbody (BB). The MODIS Characterization Support Team (MCST) at NASA/GSFC has been responsible for supporting sensor calibration and characterization tasks from pre-launch to post launch. In this paper, we describe current MCST efforts and progress made to examine sensor stability and inter-calibration consistency using observations over Dome Concordia, Antarctica. Results show that this site can provide useful calibration reference for Earth-observing sensors.

Keywords: MODIS, solar diffuser, blackbody, calibration, Dome C, inter-comparison, sensor.