MODIS On-Orbit Performance and Lessons Learned

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MODIS is a key instrument for the NASA's Earth Observing System (EOS) and has successfully operated for more than 11 and 9 years, respectively, on-board the Terra and Aqua spacecraft. MODIS collects data in 36 spectral bands, covering wavelengths from visible (VIS) to long-wave infrared (LWIR). To date, both Terra and Aqua MODIS have produced an unprecedented amount of data products and significantly contributed to the earth remote sensing studies and applications. MODIS was developed with stringent calibration requirements and was, consequently, designed and built with a set of on-board calibrators (OBC), which include a solar diffuser (SD), a solar diffuser stability monitor (SDSM), a blackbody (BB), and a spectroradiometric calibration assembly (SRCA). This presentation briefly reviews MODIS instrument operation and various calibration and characterization activities, It demonstrates both the instrument and the OBC on-orbit performance and discusses lessons learned, particularly focusing on on-orbit changes in sensor responses, optics degradation, and major challenging issues. As expected, Terra and Aqua MODIS on-orbit performance and lessons learned will continue to benefit the operation and calibration of future sensors, such as NPP/JPSS VIIRS and GOES-R ABI.