

Status of Aqua MODIS Instrument On-orbit Operation and Calibration

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The Aqua MOderate resolution Imaging Spectroradiometer (MODIS) has successfully operated for nearly a decade, since its launch in May 2002. MODIS was developed and designed with improvements over its heritage sensors in terms of its overall spectral, spatial, and temporal characteristics, and with more stringent calibration requirements. MODIS carries a set of on-board calibrators that can be used to track and monitor its on-orbit radiometric, spectral, and spatial performance. Since launch, extensive instrument calibration and characterization activities have been scheduled and executed by the MODIS Characterization Support Team (MCST). These efforts are made to assure the quality of instrument calibration and L1B data products, as well as support all science disciplines (land, ocean, and atmospheric) for continuous improvements of science data product quality. MODIS observations from both Terra and Aqua have significantly contributed to the science and user community over a wide range of research activities and applications. This paper provides an overview of Aqua MODIS on-orbit operation and calibration activities, instrument health status, and on-board calibrators (OBC) performance. On-orbit changes of key sensor parameters, such as spectral band radiometric responses, center wavelengths, and bandwidth, are illustrated and compared with those derived from its predecessor, Terra MODIS. Lessons and challenges identified from Aqua MODIS performance are also discussed in this paper. These lessons are not only critical to future improvements of Aqua MODIS on-orbit operation and calibration but also beneficial to its follow-on instrument, the Visible Infrared Imager Radiometer Suite (VIIRS) to be launched on NPOESS Preparatory Project (NPP) spacecraft.