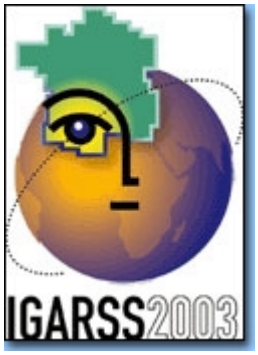
This year's theme was Learning Earth's Shapes and Colors. 149 topics were arranged into 7 sections, including:

- **Applications of Remote Sensing**
- **Mission and Programs**
- **Geoscience, Modeling, & Processing**
- **Data Processing & Algorithms**
- **Electromagnetic Problems**
- **Instrumentation & Techniques**
- **Policy, Societal Issues, & Education Initiatives**



An Overview of MODIS On-orbit Calibration and Instrument Performance

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***Abstract* - The MODIS ProtoFlight Model on-board the EOS Terra spacecraft was launched on December 18, 1999 and the Flight Model 1 on-board the EOS Aqua spacecraft was launched on May 04, 2002. Together they have produced over 5 years of calibrated data sets from which many land, oceans, and atmosphere products have been developed for and provided to the science community and public users for better understanding of both long- and short-term changes in the global environment. Overall, both Terra and Aqua MODIS have been performing well with constant on-orbit calibration and characterization efforts. The Level 1B algorithms and the corresponding production code used to generate the calibrated data sets are mature and stable.**

Keywords - MODIS; EOS; Terra; Aqua; calibration; sensor; radiometry; soalr diffuser; blackbody

I. INTRODUCTION

The MODerate Resolution Imaging Spectroradiometer (MODIS), the cornerstone instrument for the NASA's Earth Observing System (EOS), is currently operating on both the EOS Terra (10:30 AM, descending node, 705 km near sun-synchronous polar orbit) and EOS Aqua spacecraft (1:30 PM, ascending node). The MODIS Protoflight Model (PFM) onboard the Terra has completed over 3.5 years of successful operation since its launch on December 18, 1999. The Flight Model 1 (FM1) or Aqua MODIS launched on May 4, 2002 has been in operation for over a year. Together, they have been providing unprecedented amounts of continuous global data for the science community and worldwide users for better understanding of the Earth's land, oceans, atmosphere, and their interactions with one another via both morning and afternoon observations.

Overall, both instruments are performing according to their design characteristics. Constant on-orbit calibration and characterization efforts have been made to update the calibration parameters and remove any artifacts due to instrument degradation or configuration changes. The MODIS Level 1B calibration and retrieval algorithms are currently mature and stable, enabling consistent science products to be generated and validated. There are over 40 MODIS land, oceans, and atmosphere products being processed, and distributed by the Goddard Distributed Active Archive Center (DAAC) and the MODIS Adaptive Data Processing System (MODAPS). These data may be accessed through the EOS Data Gateway (EDG).

II. INSTRUMENT BACKGROUND

MODIS has 36 spectral bands located on four focal plane assemblies (FPAs): visible (VIS), near infrared (NIR), short and middle wave infrared (SMIR), and long wave infrared (LWIR). The SMIR and LWIR FPAs are controlled by a radiative cooler to their 83K nominal operating temperature. The MODIS instrument makes observations at three spatial resolutions (nadir): 250m (bands 1-2 with 40 detectors per band), 500m (bands 3-7 with 20 detectors per band), and 1000m (bands 8-36 with 10 detectors per band). Bands 13 and 14 are TDI bands that produce both high and low gain data. Therefore there are a total of 490 detectors and 830 data samples for each instantaneous field of view (IFOV) or frame of 1 km x 1 km.

V. SUMMARY AND CONCLUSIONS

Both the Terra and Aqua MODIS instruments have been performing well on-orbit. All on-board calibrators operate normally according to their design.The L1B algorithms used to produce calibrated data products are mature and stable. Continuous global data sets and corresponding science products with improved quality have been produced with constant on-orbit calibration and characterization efforts, and the efforts made by the Goddard DAAC and MODAPS for data processing and distribution, and by the validation progresses in each science discipline. One can only imagine the impact on our understanding of the Earth's land, oceans, and atmosphere, as well as global environmental changes over time from the applications of these products and the existing and future global data sets.