MODIS Calibration Panel Meeting

Report on the

MODIS Science Calibration Plans

by

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Presentation Topics

MODIS Science Calibration/ Characterization

- Outline and Responsibilities
- MODIS-N Calibration/ Characterization Plan
- MODIS-T Calibration/ Characterization Plan
- Resources for Calibration Plans

Outline and Responsibilities for MODIS-N Calibration/ Characterization Plan

Introduction	Barker, Petroy
Pre-Launch Calibration/Characterization Methodology	SBRC-Hughes
In-Orbit Radiometric Calibration/Characterization Methodology	
Instrument-Based Calibration	
Internal sources	Barker, Petroy
External solar	Guenther, Barker, Geller, Hoyt, Mecherikunnel
External lunar	Kieffer, Hoyt
Instrument Cross-Comparison	
Cross-Sensor/within platform	Ungar, R.Muller
Cross-Platform In-Orbit	Ungar
Target Related/Aircraft	Abel, Guenther, King, Brown, Ungar
Target-Based Calibration	
Target Related/Ground Reflectance	Slater et al., Markham
Bio-Optical Oceans	Evans, Esaias
Image-Related	
Radiometric Rectification	Hall, Barker
Class-Specific Scene Equalization	Barker, Markham, Burelbach
In-Orbit Geometric Calibration	SBRC-Hughes
In-Orbit Spectral Calibration	SBRC-Hughes
Offical MODIS-N/MCST Calibration Algorithm	Barker, Petroy
Algorithm Sensitivity/Simulation Studies	Barker, Markham, Ungar, Justice, Townsend, Esaias, King

MODIS-T Calibration/ Characterization Plan Outline and Responsibilities

Introduction	Barker, Petroy
Pre-Launch Calibration/Characterization Methodology	GSFC Code 700
In-Orbit Radiometric Calibration/Characterization Methodology	
* Instrument-Based Calibration	
* Internal sources	Barker, Petroy
* External solar	Guenther, Barker, Geller, Hoyt, Mecherikunnel
* External lunar	Kieffer, Hoyt
* Instrument Cross-Comparison	
* Cross-Sensor/within platform	Ungar, R.Muller
* Cross-Platform In-Orbit	Ungar
* Target Related/Aircraft	Abel, Guenther, King, Brown, Ungar
* Target-Based Calibration	
* Target Related/Ground Reflectance	Slater et al., Markham
* Bio-Optical Oceans	Evans, Esaias
* Image-Related	
* Radiometric Rectification	Hall, Barker
* Class-Specific Scene Equalization	Barker, Markham, Burelbach
In-Orbit Geometric Calibration	GSFC Code 700
In-Orbit Spectral Calibration	GSFC Code 700
Offical MODIS-T/MCST Calibration Algorithm	Barker, Petroy
* Algorithm Sensitivity/Simulation Studies	Barker, Markham, Ungar, Justice, Townsend, Esaias, King

MODIS-N Science Calibration/ Characterization Plan

This document is intended to provide a complete and thorough presentation of the pre-launch and in-orbit radiometric, geometric, and spectral calibration/characterization efforts designed for the MODIS-N instrument. As such, this document describes the individual efforts of the contractor (Hughes/SBRC), specific science team members, and the MCST to calibrate and characterize the instrument.

MODIS-N Science Calibration/ Characterization Plan

Audience

(1) MODIS Science Management

(2) MODIS Science Team

(3) EOS Project Management

(4) EOS Project Science Office

(5) EOS Calibration Advisory Panel

MODIS-N Science Calibration/ Characterization Plan

Scope

Chapter 1 discusses the purpose and outline of this document. It includes (1) a brief description of the MODIS-N instrument and provides an overview of the science goals and how the MSCT calibration/characterization objectives fit into these goals; (2) defines the various organizations and personnel associated with the MODIS-N calibration effort and their responsibilities and interrelationships; and (3) provides schedules for the variety of prelaunch and in-orbit activities associated with the calibration/characterization effort.

Chapter 2 describes the pre-launch radiometric, spectral, and geometric calibration and characterization of the MODIS-N instrument. This section summarizes the Calibration Management Plan provided by Hughes/SBRC.

Chapter 3 provides a list of different in-orbit radiometric calibration methods for converting on-board DN to either radiance or reflectance. It includes the background, description, justification, and algorithm development of the instrument based methods (internal sources, external solar, and external lunar), the instrument cross-comparison methods (cross sensor/within platform, cross-platform in orbit, and target related/aircraft), the target-based methods (target related/ground reflectance and bio-optical oceans), and the image related methods (radiometric rectification and class-specific scene equalization).

Chapter 4 describes the in-orbit geometric calibration effort(s).

Chapter 5 describes the in-orbit spectral calibration effort(s).

Chapter 6 provides the description of the official MODIS-N/MCST calibration algorithm.

Chapter 7 includes the data dictionary/glossary and the list of acronyms.

MODIS-T Science Calibration/ Characterization Plan

This document is intended to provide a complete and thorough presentation of the pre-launch and in-orbit radiometric, geometric, and spectral calibration/characterization efforts designed for the MODIS-T instrument. As such, this document describes the individual efforts of GSFC Code 700, specific science team members, and the MCST to calibrate and characterize the instrument.

MODIS-T Science Calibration/ Characterization Plan

Audience

(1) MODIS Science Management

(2) MODIS Science Team

(3) EOS Project Management

(4) EOS Project Science Office

(5) EOS Calibration Advisory Panel

MODIS-T Science Calibration/ Characterization Plan

Scope

Chapter 1 discusses the purpose and outline of this document. It includes (1) a brief description of the MODIS-T instrument and provides an overview of the science goals and how the MSCT calibration/characterization objectives fit into these goals; (2) defines the various organizations and personnel associated with the MODIS-T calibration effort and their responsibilities and interrelationships; and (3) provides schedules for the variety of prelaunch and in-orbit activities associated with the calibration/characterization effort.

Chapter 2 describes the pre-launch radiometric, spectral, and geometric calibration and characterization of the MODIS-T instrument. This section summarizes the Calibration Management Plan provided by GSFC Code 700.

Chapter 3 provides a list of different in-orbit radiometric calibration methods for converting on-board DN to either radiance or reflectance. It includes the background, description, justification, and algorithm development of the instrument based methods (internal sources, external solar, and external lunar), the instrument cross-comparison methods (cross sensor/within platform, cross-platform in orbit, and target related/aircraft), the target-based methods (target related/ground reflectance and bio-optical oceans), and the image related methods (radiometric rectification and class-specific scene equalization).

Chapter 4 describes the in-orbit geometric calibration effort(s).

Chapter 5 describes the in-orbit spectral calibration effort(s).

Chapter 6 provides the description of the official MODIS-T/MCST calibration algorithm.

Chapter 7 includes the data dictionary/glossary and the list of acronyms.

Calibration Plan Resource List

Document	Source	Date
Thematic Mapper System Test Plan	Hughes/SBRC	4/78
Shuttle SBUV Calibration Plan	B. Guenther W. Cebula	6/86
Earth Observing System: Project Calibration Plan	McDonnell Douglas Computer Sci. Corp	11/89
Preliminary Calibration Management Plan: SAGE II	Ball Aerospace H.H. Hoshiko	6/90
MISR Calibration Management Plan	C. Bruegge et al.	8/90
HIRIS Calibration Management Plan	H. Kieffer et al.	11/90
MODIS Calibration/Characterization Plan	MCST	2/91
A MODIS-T Calibration Handbook	J. Barker D. Hoyt	2/91
Preliminary SeaWiFS Calibration plan	SeaWiFS J. Mueller R. Austin	4/91

MCST Simulation-Related Activities

Objectives

Prepare instrument requirement sensitivity curves
Support instrument trade-off studies
Support algorithm testing
Support creating and testing math models

MCST Activities

Instrument
- RAI
- Code 725
- Code 713
- SBRC

Target
- Satellite-derived (TM and AVHRR)
- Aircraft-derived (AVARIS and MAS)

Atmosphere
End-to-End Toolkit

MCST Feedback Sheet

Questions ? **Concerns ?**

Suggestions ? **Actions for Next Meeting?**

Name: **Date:**

For E-mail correspondence address GSFCmail:JBarker, JHarnden, or HGeller.
For updates on the latest events and available documents, CHECK MCST.BB bulletin board on GSFCmail.