

DRAFT

MODIS Calibration Working Group, 13 April 1992

Action items:

1. Discuss with Jim Young the choice of an integrating sphere vs field lens image plane for location of the filtered detectors in the SDSM.
2. Request, from Jim Young, detailed polarization effects of film contamination on the scan mirror for the new anticipated contamination thicknesses. *remove*
3. Request Jim Young consider and report on the feasibility of monitoring the radiance (white light) mode of operation of the SRCA. This would help characterize the transition from preflight to in-flight calibrations. *reward*
4. Request SBRC characterize the memory effect preflight. *reward.*
5. Discussion between SBRC (Pagano), Guenther, Slater, and Barker about appropriate solar spectral irradiance (the "Eos standard spectrum" from Barkstrom and higher spectral resolution data (lower accuracy!) from UofA group).
6. SBRC study the quantization noise in bands 31 and 32 vs gain-change strategy.
7. ~~Guenther~~ *ALIGAR & YOUNG* scope the scheduling problem of preflight cross-calibration of the AM and PM MODIS-N sensors. *Weber*
8. ~~SBRC~~ determine if there is any conflict between the image registration requirements and the MTF requirements, etc. *reward*
9. Guenther needs to insure that the instrument managers build-in time for cross calibration activities (radiometers, etc) at both the instrument vendors and at GE.
10. SBRC, GE, and EOS project need to provide Mueller the pointing vector through the focal point of MODIS as a function of time in WGS84 coordinates. *reward.*

MODIS Calibration Working Group, 13 April 1992

Prompts:

1. Discuss calibration changes with thermal vacuum cycling with Jim Young.
2. ~~Ask Jim Young for other data about mirror contamination film thickness~~
3. Pagano and Slater discuss rationale for radiance calibration of the solar diffuser on MODIS-N vs use of SDSM.
4. Biggar provide computed atmospheric polarization data to SBRC.
5. Biggar, C. Johnson, and Guenther need to examine requirements for having cross-calibration radiometers operate *in vacuo* at GE.

MODIS Calibration Working Group, 14 April 1992
Contamination meeting (1530-1745)

Conclusions:

The most recent study by June Tveekrem showed:

1. that the contamination thicknesses estimates are about one third of the original estimates.
2. the uniformity of contamination is much higher resulting in less than a one percent variation in reflectance across the mirror.

It was agreed that none of the proposed on-board hardware solutions were sufficiently accurate, reliable and comprehensive enough to be worthwhile to measure the changes in reflectance caused by contamination.

It was agreed that the contamination effects on reflectance, polarization, and scattering could not be reliably modeled mathematically or through the measurement of artificially contaminated surfaces.

A number of solutions were suggested, that separately or together, could lead to an adequate characterization of the scan mirror contamination.

1. Because of the wavelength sensitivity of the polarization effects, the SRCA could be used to differentiate the polarization effects from spectral absorption changes.

The following are mainly for monitoring reflectance changes of the mirror:

2. The NASIC spectrometer on the ER-2 as currently use for AVHRR calibration could be used to monitor the change in reflectance of the mirror. Improvements to NASIC would be necessary to provide the required sensitivity and accuracy. The spatial registration and stability are the two factor needing the most improvement.
3. A second spacecraft sensor could scan the same scene to determine if the scan mirror reflectance has changed. An example would be GOES or the PM MODIS (30 months after the AM launch). A suitable scene could be the southeast region of the Libyan desert.
4. The "global averaging method" by Brest and Rossow for AVHRR calibration trend analysis could be used.

We were reminded that contamination in space is not the only contamination problem. The anechoic chamber and the presence of volatiles at integration and test at GE are significant potential sources of contamination.

Algorithm Status Report

MCST depends primarily on delivery of calibration plan and algorithms from SBRC, not due until October 1992

Most of the basic algorithms to be supplied by the science team have been peer reviewed in the literature:

Abel, et al.
Gordon, et al.
Kaufman, et al.
Menzel, et al.
Slater, et al.

Above methods are being refined and further tested

A detailed review of algorithm status was not conducted due to the pressure of other issues

We hope to avoid this situation in the future by attending quarterly and other design reviews to the extent that time permits

General concerns and comments

The Cal working group would greatly benefit from increased representation from the Science Discipline Groups

MCST activities are understaffed and we recommend a full time civil servant be added

Cross calibration equipment will be available for the SBRC sphere source for SeaWiFS

AM platform filter sets (multiple sets of 25.4 mm diameter filters) should be procured with the flight filters

MODIS Science Team meeting, 14 April 1992

Action Items:

Slater provide spectral

1. SBRC should investigate the use of the solar diffuser for calibration of the 3.75 μm band.

Prompts:

~~1. Slater to look at LDEF data about cosmic ray effects on filters.~~

SBRC Thermal Trans. info from Barber.

Tentative MCST Peer Review Panel

.