

GLI calibration results for ocean color channels

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1. Introduction

The Global Imager (GLI) was launched on board the ADEOS-II in December 2002. Many calibration efforts (e.g. on-board calibration, stripe noise correction, and vicarious calibration) are made to check the sensor during mission duration time. This report summarizes the primary calibration results especially for ocean color channels, and the final selection of the calibration coefficients.

2. Calibration results

2.1 On-board calibration

On-board (i.e. lamp and solar) calibrations are carried out to investigate any change in the optics during launch and to monitor the degradation of the optics. The following GLI temporal characteristics are recognized. First, GLI output on scan-mirror side B is stable in 2%. Next, the ratio of mirror side B to A increases after launch, and decrease gradually on orbit. It is considered that the reflectance of side A decreased after launch, and recovered gradually.

2.2 Stripe noise correction

Stripe noise correction is made using earth observation data to investigate and correct the detector sensitivity and mirror reflectance difference. The stripe-pattern noise caused by detector sensitivity normalization error is relatively small. However, the stripe-pattern noise caused by mirror reflectance normalization error is relatively striking. The output difference between A and B side decreased during the mission period. The difference is opposite to the on-board calibration results, but both results show that the difference decreases.

2.2 Vicarious calibration

Vicarious calibrations using global data set and ground observation data are performed to evaluate the GLI observed radiance. These calibrations show the band characteristics for all VNIR and SWIR channels except strong absorption channels. Vicarious calibration by global data set shows scan-angle dependency and its temporal change for channels 1 to 3. In addition, vicarious calibration by ground observation data show the discrepancy of the calibration coefficient between bright and dark target. This would suggest that the GLI observed radiance has offset versus the simulated radiance.

3. Final selection of the calibration coefficient

Based on the calibration results in section 2, the following decisions were made with respect to the calibration coefficients in the GLI version2 standard processing.

- Vicarious calibration and stripe noise correction will be based on scan mirror side-B, because mirror side-B reflectance seems to be stable.
- Level-1B processing will include stripe noise correction considered temporal change.
- Level-1B processing will not include vicarious calibration coefficients, because we found the different characteristics between bright and dark targets.
- Calibration team recommends several candidates of vicarious calibration coefficients (Fig. 1) considered temporal change and scan-mirror incident angle dependency for each application. Users can use a set of coefficients among the candidates as their own choice in Level-2 processing.

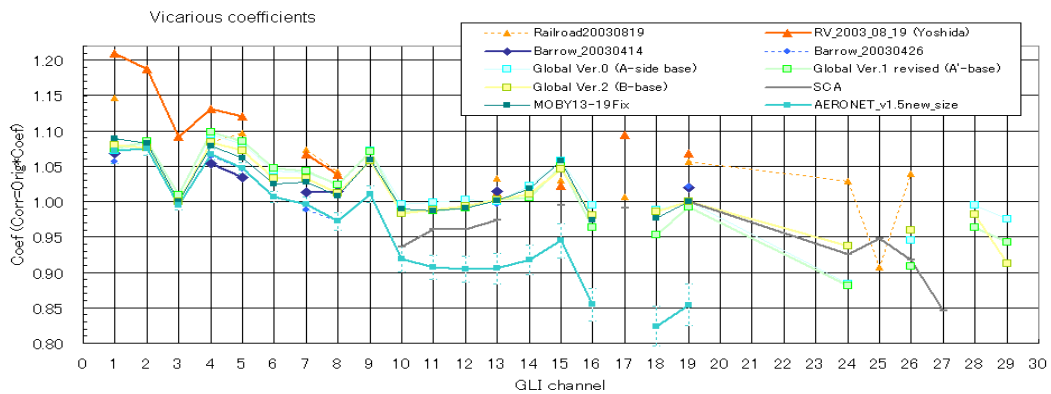


Fig.1 Candidates of calibration coefficients.