[PAY-03] In-orbit radiative transfer performance simulation of GOCI optical model with realistic coating properties

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We report a new GOCI optical model benefitted from realistic coating properties including transmission, reflection and scattering. The model incorporates the wavefront distortion error caused by the fabrication process for each optical component as well. We then input the model into the in-house built integrated ray tracing (IRT) algorithm that computes the radiative power transfer among the Sun, a high resolution target map of the coastal area of the Korean penninsular and the entire GOCI optical train. The IRT model simulation was run for extraction of GOCI radiative transfer performance following in-orbit operational sequence. The simulation results show that the GOCI optical train delivers the correct level of radiative power capable of triggering the GOCI detector response in active measurement sequence. The details of IRT model and computational technique are presented together with the simulation results and their implications.

[PAY-04] In-orbit stray light performance for GOCI with realistic surface characteristics

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We report analysis results for GOCI stray light performance in orbital measurement sequence. First, we built a full 3D GOCI opto-mechanical subsystem model with the realistic data for their surface characteristics. This model was then incorporated into the in-house built Integrated Ray Tracing (IRT) algorithm that includes the sun, the measurement target and the GOCI opto-mechanical subsystem all combined in Monte Carlo ray tracing based radiative transfer computation. The IRT simulation was run for accurate evaluation of stray light level for several solar zenith angles representing the whole sequence of day time orbital measurement. The worst case source dependent stray light, taking place at sunset and sun rise, demonstrates that the GOCI opto-mechanical subsystem is well insulated from the harmful stray light level to the detector surface in active measurement operation. The simulation results and their implications are presented as well as the GOCI opto-mechanical model and the details of stray light computation.