

Red tide detection simulation for GOCI in-orbit imaging and radiometric performance verification

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GOCI(Geostationary Ocean Color Imager) is one of two earth observation instruments onboard COMS, and it is planned to be in operation at around late 2008. The GOCI primary science objectives are i) to monitor the marine environments around Korea peninsula, ii) to produce the fishery information such as chlorophyll content, etc and iii) to monitor the long-term/short term change of marine ecosystem. We report a new end-to-end optical model for the GOCI in-orbit imaging and radiometric performance verification. The model include the source (i.e. the Sun), the observation target (i.e. 2500 km x 2500 km region) around the Korean peninsular and the payload (i.e. GOCI optical system) incorporated into a single optical ray tracing environment. It was then applied for measurement simulation of the red tide infection commonly observed in the Korean coastal water. The simulation results show that the estimated water leaving radiance from the red tide infection exhibits a close proximity to those obtained from the COART model used for the existing MODIS instrument. This demonstrates its practical usefulness that the model deployment, as an important mission support and analysis tool, can bring a significant improvement in the process throughput to the GOCI pre-flight and post-flight performance verification phases. The model concept, computational details, simulation results and implications are presented.