Tuesday, October 9
Oral Session 3
08:30–10:30

08:50–09:10

MULTI-BAND ATMOSPHERIC CORRECTION (MBAC) ALGORITHM WITH ERROR PROPAGATION FOR OCEAN COLOR RETRIEVALS

NASA's current Atmospheric Correction (AC) algorithm for ocean color utilizes two bands and their ratio in the NIR to estimate the aerosols optical thickness and type. The algorithm then extrapolates the spectral dependence of aerosols to the visible wavelength for the correction, based on model assumptions. Future advanced ocean color sensors, such as the Ocean Color Instrument (OCI) onboard the Plankton, Aerosol, Cloud, and ocean Ecosystem (PACE) satellite, will be capable of measuring the hyperspectral radiance from 350 to 900 nm and at 7 discrete SWIR channels: 940, 1038, 1250, 1378, 1615, 2130, and 2260 nm, with high radiometric accuracy. To optimally employ this unprecedented instrument capability, we propose an improved AC algorithm that utilizes all window channels in the NIR to SWIR spectral coverage to reduce the uncertainty in the AC process, namely Multi-Band AC (MBAC). A theoretical uncertainty analysis indicates that the MBAC algorithm can largely reduce the uncertainty in the remote sensing reflectance (Rrs) retrievals of the ocean caused by sensor random noise. In optically complex waters where the NIR signal is contaminated by the turbid waters, the MBAC algorithm in the SWIR improves the AC since it is less sensitive to the water turbidity. We will show results of ocean color retrievals after applying the MBAC algorithm to MODIS, VIIRS, and simulated OCI data. The MBAC algorithm and an error propagation technique of the AC process has been implemented in NASA's SeaDAS program and we will show the per-pixel uncertainty in the Rrs.

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