Thursday, October 11
Poster Session 4
10:30–12:00

Poster 267

BUILDING A RADIOMETRIC SIMULATOR FOR THE PACE MISSION: RADIATIVE TRANSFER MODELING AND SCIENCE APPLICATIONS

NASA's Plankton, Aerosol, Cloud, ocean Ecosystem (PACE) mission aims to extend and improve NASA's long-term satellite observation record of global ocean biology, aerosols, and clouds; and to advance the atmospheric and oceanic science with unprecedented spectral coverage and multi-angle polarized measurements. The primary science instrument planned for PACE is the Ocean Color Instrument (OCI): a spectrometer that will measure spectral radiance in the range of 350-885 nm at 5 nm spectral resolution, in combination with several discrete shortwave infrared bands. In addition, PACE is expected to carry two polarimeters, Hyper Angular Rainbow Polarimeter (HARP-2) and Spectro-Polarimeter for Planetary Exploration (SPEXone). In order to facilitate the level-2 algorithm development and explore information content for the PACE instruments, it is essential to build a PACE simulator with sufficient fidelity to represent the physical processes in the combined atmosphere and ocean system. We will present a radiative transfer model that include all major light-matter interaction mechanisms, which includes the following key features: a) Atmosphere and ocean coupling; b) Gas absorption and particle scattering coupling; c) Rigorous polarization simulation; d) Inelastic scattering in ocean waters including Raman scattering and fluorescence. Simulations will be performed for a range of parameters for different atmospheric and oceanic conditions to demonstrate its applications. The synthetic dataset will be packaged into a compact look-up table that can be interpolated into different orbit and viewing geometries to generate synthetic PACE data for both OCI and the polarimeters, which can then be used in level-2 algorithm development and testing.

Pengwang Zhai, University of Maryland, Baltimore County, pwzhai@umbc.edu
Meng Gao, University of Maryland, Baltimore County, mgao@umbc.edu
Bryan Franz, NASA Goddard Space Flight Center, bryan.a.franz@nasa.gov
Jeremy Werdell, NASA Goddard Space Flight Center, jeremy.werdell@nasa.gov
Yongxiang Hu, NASA Langley Research Center, Yongxiang.Hu-1@nasa.gov
Amir Ibrahim, Universities Space Research Association, NASA Goddard Space Flight Center, amir.ibrahim@nasa.gov