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Sommario/riassunto	Earth’s atmosphere and oceans play individual and interconnected roles in regulating climate and the hydrological system, supporting organisms and ecosystems, and contributing to the well-being of human communities and economies. Recognizing the importance of these two geophysical fluids, NASA designed the Plankton, Aerosol, Cloud and ocean Ecosystems (PACE) mission to bring cutting edge technology to space borne measurements of the atmosphere and ocean. PACE will carry the Ocean Color Instrument (OCI), a radiometer with hyperspectral capability from the ultraviolet through the near-infrared, plus eight discreet shortwave infrared bands. Thus, OCI will measure the broadest solar spectrum of any NASA instrument, to date. PACE’s second instrument will be a Multi-Angle Polarimeter (MAP). MAP will be NASA’s first imaging polarimeter on board a comprehensive Earth science mission. These instruments bring new capability to the science community, but also new challenges. Fundamentals, such as basic radiative transfer models, require review, enhancements and benchmarking in order to meet the needs of the atmosphere-ocean communities in the PACE era. Both OCI and MAP will bring opportunities to continue heritage climate data records of aerosols and clouds and to advance characterization of these atmospheric constituents with new macrophysical and microphysical parameters.

The ability to better characterize atmospheric constituents is a necessity to better separate ocean and atmosphere signals in order to fully realize the potential of PACE measurements for oceanic observations. Atmospheric correction in the PACE era must address the expanded wavelength range and resolution of OCI images, requiring new approaches that go beyond heritage algorithms. This Research Topic encompasses fundamental radiative transfer studies, with application to the atmosphere, ocean or coupled atmosphere-ocean system