Advanced cloud products from the PACE mission

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The sensitivity of cloud properties to changes in the climate and to anthropogenic aerosol emissions are highly uncertain. Improved, global cloud observations are needed to advance our knowledge on cloud processes. In this talk we will give an overview of the cloud products that are provided by NASA's Plankton, Aerosol, Cloud, ocean Ecosystem (PACE) mission, which was launched on February 8th 2024. PACE carries the Ocean Color Instrument (OCI), which is a VIS-SWIR multi-spectral imager, the Hyper-angular Rainbow Polarimeter (HARP-2) and the Spectropolarimeter for Planetary Exploration (SPEXone). We will particularly focus on the advanced, pixel-level cloud products that will be produced from observations by the polarimeters and their combinations with OCI, including cloud top phase, droplet number concentrations and full droplet size distributions. Preliminary validation of such products using data from the PACE Postlaunch Airborne eXperiment (PACE-PAX) will be shown. Additionally, we will discuss how PACE advanced cloud products may provide crucial information to reduce biases in traditional multi-spectral imager cloud retrievals, such as provided by OCI, MODIS, geostationary imagers and EarthCARE's Multi-Spectral Imager (MSI).

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