

The SPEXone polarimeter for the NASA PACE mission

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There is growing consensus in the aerosol remote sensing community that multi-angle photo-polarimetric measurements are essential to unambiguously determine all aerosol properties relevant to quantify and understand the impact of aerosols on climate and air quality. The NASA PACE mission, to be launched in 2022, will carry two polarimeters: HARP-2 and SPEXone. This presentation will focus on the SPEXone instrument, developed in the Netherlands. The SPEXone instrument will provide hyperspectral radiance and polarization measurements in the spectral range 385–770 nm observing each ground pixel from five viewing angles. SPEXone is a narrow-swath instrument with very high polarimetric accuracy and a spatial sampling of ~2.5 km. SPEXone will deliver unprecedented information on a.o. aerosol absorption (SSA), aerosol amount (AOT, number column), aerosol type (through complex refractive index and particle shape), and size. We will provide an instrument overview and discuss expected retrieval capabilities. We will also discuss the algorithms that are being developed for the retrieval of aerosol and cloud properties from SPEXone, including their application to measurements of the SPEX airborne instrument on the NASA ER-2 high altitude aircraft, and to POLDER-3 measurements.

Mode of presentation: Invited