Synthetic analysis of aerosol retrieval over the ocean based on two neural network models for the PACE/ SPEXone

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The PACE mission [1] was successfully launched on February 8, 2024, and the SPEXone[2] payload on board it is a Multi-angle Polarimetric (MAP) hyperspectral payload. For aerosol retrieval from MAP measurements over the ocean it is important to accurately account for the contribution of the ocean-body to the top-of-atmosphere signal, especially for wavelengths < 500 nm. Performing online radiative transfer calculations in the coupled atmosphere ocean system is too time consuming for operational retrieval algorithms. Therefore, mostly lookup-table are used that store the reflection matrix from the ocean body that is being used as the lower boundary in an atmospheric radiative transfer model. For hyperspectral measurements such as those like SPEXone, also the use of lookup tables is unfeasible because they will become simply too big. In this talk we will compare two different neural networks (NN) [3] to model the ocean body reflection matrices for aerosol retrieval over ocean [4]. The two NN approaches will be applied for the synthetic retrieval with the SPEXone setup and also the real data collected by SPEX airborne [5] during the ACEPOL campaign. The aerosol optical thickness will be validated with the HSRL-2[6] lidar data.

References (Preferred mode of presentation: **Oral)**

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