

ANN retrieval of above-water polarization and water parameters from PACE and validation in ocean cruises

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Polarimetric information from aerosols and clouds is widely used to improve the results of retrievals. Characterization of the properties of the in-water particles from satellite polarimetric observations is more challenging because of the difficulties in atmospheric correction and the smaller degree of linear polarization (DoLP) of the water leaving radiance. Using an artificial neural network (ANN) approach, we developed algorithms for the retrieval of the DoLP₀₊ of the water leaving radiance from the Top of the Atmosphere (TOA) DoLP and further for the retrieval of the water attenuation to absorption ratio, extending the set of retrieved water parameters from space [1]. With the launch of the NASA Phytoplankton, Aerosol, Cloud, ocean Ecosystem (PACE) satellite mission, which has a HARP2 polarimeter on board and Ocean Color Instrument (OCI), these algorithms were validated by the comparison of the retrieved DoLP₀₊ data with the data measured in several ocean cruises by the unique polarimetric multi- and hyperspectral imaging system and comparison of retrieved attenuation to absorption ratio with measured by flow-through systems and at the stations. Results of the DoLP₀₊ and c/a retrievals will be presented together with the results of the validation efforts and maps of DoLP₀₊ and newly retrieved water parameters for several areas.

References

- [1] J. Agagliate, R. Foster, A. Ibrahim and A. Gilerson, "A neural network approach to the estimation of in-water attenuation to absorption ratios from PACE mission measurements," *Frontiers in Remote Sensing*, 2023

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