



## Cloud retrievals using ship-based spectral transmissivity measurements

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Within the scope of the OCEANET-Project (autonomous measurement platforms for energy and material exchange between ocean and atmosphere) on board of the research vessel Polarstern clouds have been investigated over the Atlantic Ocean under different atmospheric conditions and climate zones by active and passive remote sensing. An existing measurement platform, including lidar, microwave radiometer, all sky camera and broadband radiation sensors, has been extended by spectral radiation measurements with the COmpact RAdiation measurements System (CORAS). CORAS measures spectral downward radiances and irradiances in the visible to near-infrared wavelength region. The data were corrected to consider the movements of the ship and with it the misalignment of the sensor plane from earth's horizon. Using observed and modeled spectral transmitted radiances cloud properties such as cloud optical thickness ( $\tau$ ) and effective radius ( $r_{eff}$ ) were retrieved. The vertical cloud structure with limitations for thick clouds is obtained from lidar and microwave radiometer measurements. The all sky camera provides information on the horizontal cloud variability. Cloud optical thickness and effective radius, will be retrieved by using a plane parallel radiative transfer model. It is planned to compare these results with retrievals based on three-dimensional radiation simulations using a Monte Carlo method.