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Investigation of aerosol radiative forcing and atmosphere-ocean remote sensing in Northern Norway

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We examine aerosol optical properties and radiative forcing at Andenes, Northern Norway (69N, 16E, 379 m altitude) during a two-year period (2008-2010) using AERONET data, radiative transfer modelling (C-DISORT), and Mie-scattering computations. We show that the mean value of the aerosol optical thickness at 500 nm derived from AERONET measurements is close to that obtained from Mie-scattering computations with input of aerosol size distribution and refractive index as derived from AERONET measurements. Also, different models for the ground reflectance used as input to the radiative transfer computations are shown to have little impact on the aerosol radiative forcing both at the top and bottom of the atmosphere. The coupled atmosphere-surface system accounted for by C-DISORT is suitable for radiative transfer calculations over open ocean and coastal water areas, and we discuss how it can be used to make simultaneous retrieval of aerosol and marine parameters from ocean colour data.