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Aerosol optical depth over the Arctic: a comparison of two global aerosol models with ground-based, satellite and reanalysis data

J. von Hardenberg (1), L. Vozella (1), V. Vitale (2), A. Lupi (2), M. Mazzola (2), T. P. C. van Noije (3), A. Strunk (3), and A. Provenzale (1)

(1) Institute of Atmospheric Sciences and Climate - CNR, Torino, Italy (j.vonhardenberg@isac.cnr.it), (2) Institute of Atmospheric Sciences and Climate - CNR, Bologna, Italy, (3) Royal Netherlands Meteorological Institute, de Bilt, The Netherlands

We compare ground-based measurements of aerosol optical depth and Ångström parameter at six Arctic stations in the period 2001-2006 with the results from two global aerosol dynamics and transport models, ECHAM-HAM and TM5. Satellite measurements from MODIS and the MACC reanalysis product are used to examine the spatial distribution and the seasonality of these parameters and to compare them with model results. We find that both models provide a good reproduction of the Ångström parameter but significantly underestimate the observed AOD values. We also explore the effects of changes in emissions, model resolution and the parametrization of wet scavenging.