Geophysical Research Abstracts,
Vol. 11, EGU2009-3843, 2009
EGU General Assembly 2009

The Radiative and Dynamical Impact of Aerosols on Mixed-phase Clouds Observed During ISDAC and M-PACE

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In this study, we investigate how properties of arctic aerosols observed during April 2008 in the ARM Indirect and Semi-Direct Aerosol Campaign (ISDAC) differ from those measured during the Mixed-Phase Arctic Cloud Experiment (M-PACE) in October in the Weather Research Forecast model run at 1km resolution. These studies initially focus on validating the model's simulation of arctic clouds observed during ISDAC. The model then is used to simulate the sensitivity of arctic clouds and the surface energy budget to the differences in aerosol between April and October. In addition, we present results of model simulations that identify to what extent the different properties of the arctic aerosol during April produce differences in the microphysical and macrophysical properties of clouds and the surface energy balance.