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Climate-relevant aerosols in the Alaskan Arctic in 2008: Characteristics, sources, transport, and removal

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Airborne measurements of trace gases and aerosol microphysical, chemical, and optical properties were made in the Alaskan Arctic during April 2008 as part of the POLARCAT component of the International Polar Year. Agricultural burning in Kazakhstan and southwestern Siberia, and wildfires in far eastern Siberia, produced large plumes of light-absorbing smoke that were advected to the Arctic. In addition to these dense smokes, a more diffuse aerosol was also present over the sea ice. Preliminary analyses show that this "Arctic haze" aerosol was highly aged, dominated by accumulation mode particles, and contained sulfates and soot with a modest contribution from organics. Depletion of particle concentrations and mass within the surface inversion over the sea ice suggests a significant role for precipitation scavenging of the aerosol and deposition to the surface.