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Variability of aerosols at NEEM, Greenland during the last glacial period

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A new deep ice core was drilled at NEEM, Greenland during the 2008-2011 field season. The bedrock was reached at 2540m depth. During 2009- 2011, CFA (Continuous Flow Analysis) was carried out. Discrete samples were collected from the CFA melt fractions, and were distributed to different laboratories. Ionic species were analyzed at National Institute of Polar Research (Japan) and Alfred Wegener Institute for Polar and Marine Research (Germany) with ion chromatographs. Here we present and compare the ion concentration data obtained by both institutes. Most of the ions show good agreement between the two institutes. Concentrations of calcium, sodium, chloride, fluoride, sulfate, potassium and magnesium, show large variations associated with Dansgaard-Oeschger (DO) events, as has been already reported for other Greenland ice cores. New ion data obtained from the NEEM deep core display large variability of oxalate and phosphate concentrations during DO events. On the other hand, nitrate, ammonium and methanesulfonate do not show such variations. The millennial scale variations of ions are thought to be caused by changes in atmospheric circulation and source strength.

Keywords: NEEM, Greenland, ice core, last glacial period, ion concentration, Dansgaard-Oeschger (DO) events