



Ice core dust record over the last deglaciation from the new Berkner Island (Antarctica)

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A new 950 m deep ice core record has been extracted from Berkner Island (78.36S, 45.43W, 900 m elevation), through a collaborative project (UK, France) to document the paleoclimate from a coastal area. The site is located nearby the Weddell sea and the under strong marine influence is reflected by the accumulation rate (13 g cm⁻²a⁻¹) and temperature (−26C). The record may cover up to the last 20-50 kyrs before present.

We have studied the insoluble dust content by using a Coulter counter multisizer® apparatus set for the measurements of concentration and size distribution for particles larger than 0.8 microns equivalent diameter up to 20 micron within 256 channels. The selected ice increments cover a least one year of accumulation and all have been decontaminated firstly by a band saw and secondly by rinsing in pure water from a clean room.

As first results, the ice from recent Holocene period is very clean and contents dramatically low concentration of dust (less than 3 ppb in total) which have been never measured for Antarctic ice. The dust flux is also the lowest, that be a sign of the marine character of the drill location site, and for the dust emitted from the southern continent their low probability to reach this area.

The deep ice samples content much more material and the concentrations are about 1000 ppb that is about 300 higher than for upper samples. These samples are contemporaneous from the last glacial period and the dust profile suggests the Last Glacial to Holocene transition (circa 15 kyrs BP) is located at about 650 m depth.

The dust concentrations for glacial samples are comparable in magnitude to sample from inland site such as Vostok, Epica Dome C, Dome B, Komsomolskaya. Since the inland sites are located at altitude higher than 3000 m a.s.l, and under dry deep core climate (below -50°C), the preliminary dust measurements would suggest dramatic changes in ice sheet extend and altitude in the Berkner area or change in ice origin. This hypothesis will be further tested by on-going geochemical analysis.