



Rare Earth Elements as tracers of continental dust origin in EPICA Dome C ice during glacial and interglacial periods

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Rare Earth Elements (REE) have been widely adopted as excellent proxies for several geochemical processes. So far, REE determinations have been rarely attempted in glacial paleoclimatic archives essentially because of the extremely low REE concentration and because of the limited volume of the samples. Here we present REE determination in the EPICA Dome C ice core during the last glacial/interglacial transition. The methodology adopted allowed the direct determination of REE in a 1 ml sample of Antarctic molten ice with concentration ranges between a few femtograms per gram for Tm up to several tens of picograms per gram for Ce. REE crustal normalized patterns were calculated for about 200 samples and were evaluated with an unprecedented temporal detail. We show that REE patterns during the last glacial maximum are extremely homogeneous, with a slight enrichment for medium REE. In contrast REE patterns during the Holocene are highly heterogeneous with main remarkable enrichment for light REE. Comparison of REE determined in Antarctic Dome C ice with REE abundance in some potential source areas allows the advance of some new hypothesis concerning dust provenance on the East Antarctic continent

on a glacial/interglacial timescale.