



## **South American provenance of glacial dust in East Antarctica since the Early Pleistocene**

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The assessment of atmospheric dust changes in Quaternary times and the identification of the major dust source areas are key issues for paleoclimate research and fundamental inputs for GCM simulations. While the Late Pleistocene and the Holocene paleo-dust cycle is well documented by means of numerous ice cores recovered in central East Antarctica, only the Vostok (78°28' S, 106°48' E) and the EPICA (*European Project for Ice Coring in Antarctica*)-Dome C (EDC, 75°06' S, 123°21' E) ice cores allow extension of the climate record far back in time into the Middle and Early Pleistocene.

Here we investigate the geographic provenance of dust windborne to East Antarctica during ancient glacial ages using Sr and Nd isotopes as *tracers*. The isotopic signature for EDC and Vostok dust points towards a dominant South American origin during Marine Isotopic Stage (MIS) 8, 10, 12, and back to MIS 16 and 20 as deduced from EDC core. Data provide evidence for a persistent overall westerly circulation pattern allowing efficient transfer of dust from South America to the interior of the Antarctic plateau during Pleistocene glacial ages. However, some dissimilarity between old and recent glacial ages suggests a slight reduction in the Patagonian source strength and/or a relatively more important contribution from other South American provinces during ancient glacial ages. A weaker Patagonian source ultimately opens the possibility for

reduced production of fine glacial material in relation to varying glacier coverage.