# REE-based reconstruction and quantification of dust flux provenances at EDML, East Antarctica, over the Last Glacial-Interglacial Transition

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To elucidate the atmospheric circulation changes in the past and present climate, the determination of dust provenance in eolian deposits - *i.e.*, sediment or ice cores - is paramount. Antarctic ice cores have revealed the tight interplay between dust flux to the Southern Hemisphere and the climate. However, so far, the unambiguous identification of Antarctic dust sources and their evolution through time remain limited due to the substantial amounts of dust usually required by geochemical analyses. Here, using an in-depth statistical modeling specifically developed for Rare Earth Elements (REE) patterns from dust samples collected in ice cores (Epica Dronning Maud Land - EDML)[1] and from potential source areas (PSAs) over the Southern Hemisphere, we identified and quantified the source evolution of atmospheric depositions in E. Antarctica over the Last Glacial-Interglacial Transition (LGIT). Strontium, Nd and Pb isotopic data are also compared with our REE results. We showed that many sources are involved in the dust mixing reaching EDML with, as shown before, Patagonia as the most important source followed by Australia, Southern Africa (SAF), New-Zealand (NZ) and Puna-Altiplano plateau. During the Last Glacial Maximum (LGM), dust reaching EDML is mostly from glacier driven sources (Patagonia and NZ) while Holocene is characterised by larger relative contributions from desertic source regions (SAF and Australia). We could also relate the evolution of dust provenance and flux to document climatic transitions within PSAs and at a larger scale within the Southern Hemisphere. This work provides major implications for the reconstruction of atmospheric paleocirculation and paleoclimate.

1. Wegner A. *et al*. (2012), Climate of the Past, 8, 135-147