REE distributions in the Southern Indian Ocean with a focus on land-ocean inputs (SWINGS GEOTRACES cruise)

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Distributions of dissolved rare earth elements (DREE) were established along 25 vertical profiles in the northern part of the SWINGS GEOTRACES section (MD229/GS02) in the Southwest Indian Ocean. In the open ocean, DREE concentrations display nutrient-like profiles, with Nd (Yb) concentrations varying between ca 7 (2) pmol/kg and almost 40 (7) pmol/kg between the surface and the deepest part of the profiles. These data compare well with those acquired by Garcia-Solsona et al. (2014) along the BONUS-GOODHOPE section, few degrees farther west. A latitudinal gradient is observed in the upper 1000m between the tropical stations (average Nd <10 pmol/kg) and the most southern ones (Nd>13 pmol/kg). Margin lithogenic inputs are detected off the South African coast, with Nd concentrations up to 17 pmol/kg. However, the Agulhas current prevents the direct spread of this enrichment towards the open sea. Contrastingly, the Agulhas Return Current transports these enriched waters to the middle of the “South African-Marion islands” section. Lithogenic enrichments are less pronounced along the Marion island shelf. Atmospheric dust signal is clearly detected in the middle of the Mozambic Channel. A slight enrichment attests the occurrence of hydrothermal activity above the South West Indian Ridge (SWIR). Preliminary Nd isotopic compositions might help identifying the various enrichment sources encountered along the section.