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Chasing dust across glacial-interglacial North Africa through radiogenic Sr-Nd-Hf-Pb isotopes of eolian deposits off the coast of West Africa.

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The radiogenic isotope systematics of Sr ($^{87}Sr/^{86}Sr$), Nd ($^{147}Nd/^{143}Nd$, εNd), Hf ($^{176}Hf/^{177}Hf$, εHf) and Pb ($^{208,207,206}Pb/^{204}Pb$, $^{207,208}Pb/^{206}Pb$) measured at high precision in terrestrial mineral dust particles and their potential source areas (PSA) play a crucial role in our understanding of emission, transport and deposition of mineral dust. Changes in dust fluxes and dominant PSA across glacial-interglacial periods are expected to impact ocean productivity and its influence on modern and past climate of the planet. We present new isotope data from sediment core GS7205-60 from off West Africa, a core whose location (18.71^{o}N, 20.89^{o}W; 1740 m W.D.) nearly duplicates the position of ODP Site 659. Core GS7205-60 spans multiple glacial-interglacial cycles based on comparisons to Site 659, a site with a well-established chronology. Samples were taken from intervals in GS7205-60 that correspond with episodes of significant dust variability based on high-resolution X-ray fluorescence elemental profiles (such as Fe) as a measure of changes in dust input to the site. The Sr, Nd and Pb isotopes were measured in the detrital fraction after removing the organics, biogenic carbonate, Fe and Mn oxyhydroxides, and biogenic silica. The Hf isotopes were measured after fusing the samples with lithium metaborate flux at 1200 °C to ensure complete zircon dissolution. The Sr-Nd-Hf isotope profiles maintain a similar range throughout episodes of low and high dust export to this site during the last glacial period and the penultimate glacial maximum; a significant deviation from these glacial values is observed in Sr-Nd-Hf isotope values during the low dust episode of the Eemian interglacial period. If this finding is confirmed (or rejected) as we increase the sample resolution, the observed variability can help improve our understanding of how glacial-interglacial forcing mechanisms impact the flux and source of mineral dust from North Africa's shifting PSA through time. Lead isotopes show partial overlap with modern African dust collected over the East and West Atlantic receptor sites (Barbados and Cayenne) and around the modern Bodélé Depression. We need to characterize PSA across North Africa for Pb isotopes to cast a more nuanced light on glacial-interglacial dust emission and transport from these regions.