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Shallow recycling of lower continental crust: The Mahoney Seamount at the Southwest Indian Ridge.

DOMINIC WÖLKI[1], VINCENT SALTERS[2], CHRISTOPH BEIER[3], HENRY J B DICK[4], JUERGEN KOEPKE[5] AND RENÉ H.W. ROMER[6]

[1]National High-Magnetic Field Laboratory, Florida State University

[2]National High-Magnetic Field Laboratory/FSU

[3]University of Helsinki

[4]Woods Hole Oceanographic Institutuion

[5]Universiaet Hanover

[6]GeoZentrum Nordbayern, Friedrich-Alexander-Universität Erlangen

Presenting Author: dominic.woelki@fau.de

Highly vesicular basalts from the newly discovered Mahoney Seamount north of the Southwest Indian Ridge (SWIR) have unradiogenic Nd-Hf together with radiogenic Sr isotopic compositions. A distinct low $^{206}Pb/^{204}Pb$ isotope signature combined with high $^{207}Pb/^{204}Pb$ and $^{208}Pb/^{204}Pb$ are best explained by melting of a mantle that has been strongly influenced by stranded lower continental crust. Using isotope data and geodynamical arguments, we favor the idea of shallow recycling of lower continental crust isolated for a longer period contributing to melts forming Mahoney Seamount. These melts are subsequently erupted through off-axis fault systems. The isotopic composition of Mahoney Seamount lavas shares many characteristics with EM-1 sources and the so-called DUPAL signature. Previous isotopic studies on the SWIR proposed recycling of ancient subcontinental lithospheric mantle or sediments with oceanic crust to be responsible for the DUPAL signature. However, the restricted occurrence of the extreme lower continental crustal signature at Mahoney Seamount implies that the DUPAL signature here has a different origin.