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SESSION TITLE: T51H. The Origin of Intraplate Volcanism: Hotspots, Nonhotspots, and Large Igneous Provinces III Posters

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ABSTRACT BODY: Several mantle xenoliths from the island of Sao Miguel (Azores, Portugal) have been studied to investigate the nature of the mantle beneath the Azorean archipelago. Ultramafic xenoliths are porphyroclastic spinel harzburgite and subordinate clinopyroxene-poor lherzolite, range between 3 and 10 cm in size and show clear signs of plastic deformation.
In harzburgites, olivine porphyroclasts have Fo_{89-91}, while in neoblasts it ranges between 80 and 87. Mg# in orthopyroxene and clinopyroxene spans between 85-91 and 84-92 respectively, while spinel is characterized by Cr# between 64 and 78. Two harzburgites show phlogopite. In lherzolite, olivine porphyroclasts show Fo_{89-91}, orthopyroxenes and clinopyroxenes have Mg# 91-92 and 90-92 respectively, and spinel has Cr# 76-84.
Abundant silica- and alkali-rich glass is present as intergranular micro-veins, and as primary melt inclusions in both porphyroclasts and neoblasts. Orthopyroxene porphyroclasts (1 – 6 mm) have exsolution-free rims, strong ondulatory extinction, and clinopyroxene exsolution at the core as well as abundant primary Silicate Melt Inclusions (SMIs). SMIs are quartz-hyperstene normative trachydacitic silicate glass (SiO_2 = 62.3-67.9 wt%), containing CO_2 bubbles. Trachydacitic glass is particularly rich in alkali, LILE (e.g., Rb, Ba, and Sr), LREE-enriched, and strongly depleted in HFSE, MREE and HREE, compatible with a melt containing a large component of deep eclogitic source (e.g. residual garnet and rutile). Olivine, clinopyroxene and rare orthopyroxene polygonal neoblasts (< 0.5 mm) also contain primary SMIs. However, these last SMIs are trachyte-phonolite, mostly nepheline normative and are REE- and HFSE-enriched, have low LREE/MREE ratios and selective LILE enrichment, consistent with small fractions of metasomatic melts generated from an upper mantle source.
Some xenoliths contain melt inclusions of both kinds, but some record just one of the two metasomatic events that have refertilized the refractory mantle. We interpret the high local mantle fertility beneath the Azores to be derived by the recycling of buoyant oceanic crust material that refertilizes the refractory mantle by percolation of eclogite partial melts, such as those hosted in orthopyroxene porphyroclasts. Our data provide evidence for storage of mafic oceanic slab enclaves

in a heterogeneous upper mantle in a region of ocean island basalt volcanism.

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