Two distinct low $\epsilon$Hf components in Azores lavas

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We present Hf-isotope data on well characterized lavas from the Azores islands, dredged samples from the Terceira Rift (TR), and the Joaõ do Castro seamount (JdC), with the goal of understanding the Azores plume heterogeneity in the context of plume-triple junction interaction.

Saõ Miguel island (SM) and JdC lavas form two distinct steep arrays extending below the mantle array in $\epsilon$Hf-$\epsilon$Nd space. JdC overlaps Mangaia (HIMU) lavas in $\epsilon$Hf-$\epsilon$Nd space, but has unradiogenic Pb isotopes, unlike HIMU. SM and JdC are also distinct in their Sr and Pb isotopes. Therefore, the two low $\epsilon$Hf end-members are not of HIMU origin, and if they are related to recycled metasomatized lithosphere [1, 2], then our data shows that this is spatially variable within the plume.

These two low $\epsilon$Hf end-members seem to be highly local features, not influencing the composition of the Western and Main groups of islands. Varying lithosphere thickness at the complex Azores plume – triple ridge junction is likely to control mixing and repartition of mantle components.

Figure 1: (a) $\epsilon$Nd-$\epsilon$Hf plot of Azores lavas showing the discussed arrays. (b) $^{206}$Pb/$^{204}$Pb-$\epsilon$Hf plot of the same data.