Probing the deep crust of the Ribeira Fold Belt, Brazil: Sr-Nd-Pb isotope geochemistry and *in situ* zircon dating of Neoproterozoic granites

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The Ribeira Fold Belt in SE Brazil is made up of low- to medium-grade Statherian-Calymmian (~1.8-1.4 Ga) meta-volcano-sedimentary sequences succeeded by younger (~1.0-0.55 Ga) foreland basins. Exposures of basement rocks are restrict to a few Paleoproterozoic (~2.2-2.0 Ga) granite-gneiss nuclei. Ediacaran (0.63-0.56 Ga) granites related to plate convergence and post-orogenic extension make up ca. 30% of the exposed belt, and provide windows to its deep crustal structure.

Geochemical and Sm-Nd isotope signatures point to a major contribution from older than 2.0 Ga granite-gneiss sources to the Ediacaran granite magmatism. This is reinforced by the predominance of Paleoproterozoic ages in the inherited zircon assemblages, indicating that the belt is underlain by thick crystalline basement. However, contributions from younger sources are needed to explain the range of Nd T_{DM} (dominantly 2.2-1.8 Ga; as young as 1.5 Ga), clearly distinct from that of the outcropping basement (Nd T_{DM}~ 2.5-3.0 Ga).

Sr-Nd-Pb isotope geochemistry reveals important lateral and vertical zonation in the basement and helps identify contributions from additional sources. K-feldspar Pb isotope signature clearly discriminates contributions from U-rich meta-sedimentary sequences (also characterized by high $^{87}Sr/^{86}Sr(t=0.6\ Ga)$) and old, low U, low U/Th granulitic lower crust (with low $^{87}Sr/^{86}Sr(t)$ and strongly negative εNd(t)). An enriched mantle component can be identified by shifts towards less negative εNd(t) and lower $^{87}Sr/^{86}Sr(t)$, most evident in the post-orogenic magmatism. The εNd(0.6 Ga) of the typical metasedimentary rocks are less negative than the basement (-15 to -20 *versus* -20 to -30), reflecting some participation of younger juvenile sources in the detrital budget. Melting of the supracrustal sequences may therefore also contribute to the younging of granite Nd T_{DM} relative to the older than 2.0 Ga granite-gneiss sources.

Financial support: Fapesp, Proc. 2012/04148-0