

## Lithosphere features from garnet xenocrysts of the western edge of São Francisco Craton, Brazil

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A significant number of Cretaceous kimberlites and related rocks intruded the western edge of São Francisco Craton. Geophysical data indicate an SCLM patterns that is thicker lithosphere beneath parts of the Brasília Belt and most of the alkaline intrusions coincident with a low-velocity zone with a shallow SCLM [e.g. 1].

Geothermobarometry studies of garnet xenocrysts [e.g. 2] from rock concentrates (Poço Verde 2, Limeira 8, Limpeza 15, Três Ranchos 4, Joana 7 and Canastra 1) and stream samples showed lithosphere-asthenosphere boundaries (LAB) varying from 55 to 140 km for both groups. Most of the garnet populations are lherzoritic but low-Cr and wherlitic grains also occur; only a few samples have sinuous REE patterns. However, calculations of the composition of coexisting olivine suggest that highly depleted rocks are present at relatively shallow levels in the garnet stability field.

Canastra 1 pipe identified by [3] as primary diamond source has more high-Ti grains from below 140 km, while a cluster of high-Ti, high-Zr grains come from shallow depths. Três Ranchos 4, while derived from a mantle conditions favorable for diamonds [4], shows a poorly-defined LAB and high Ti values at depths of 120 Km suggest metasomatism.

The available data define an SCLM of variable thickness, consistent with geophysics. This generally thin lithosphere has been affected by melt-related and possibly by carbonatitic metasomatism, consistent with studies of mantle xenoliths [e.g. 5, 6].

[1] Assumpção et al. (2017) *In: Heilbron, Cordani and Alkmim (eds.) (2017) São Francisco Craton, Eastern Brazil. Tectonic Genealogy of a Miniature Continent*, 15-25. [2] Griffin et al. (1989b) *Contrib. Mineral. Petrol.*, **103**, 199 – 202; [3] Chaves et al. (2008) *Geociências (São Paulo)*, **27(3)**, 299-317 [4] Costa (1997) *unpublished Msc thesis*; [5] Naninni (2016) *unpublished PhD thesis*; [6] Almeida (2009) *unpublished Msc thesis*.