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First ID-TIMS U-Pb baddeleyite ages of diabase dykes from the Ponta Grossa Arch support previous $^{40}\text{Ar}/^{39}\text{Ar}$ results and northward migration of the Paraná-Etendeka magmatism

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Three main diabase dyke swarms are exposed east of the Paraná-Etendeka Magmatic Province (PMPE) lava pile in south Brazil, from south to north: Florianópolis (FDS, oriented N15-N25E), Ponta Grossa (PGDS, N40-65W) and Serra do Mar (N40-N50E). This arrangement is interpreted by some authors as indicative of a triple junction that led to the opening of the South Atlantic Ocean, where the PGDS, perpendicular to the coastline, would constitute a failed arm.

Reviews of the geochronology of the PMPE lava pile in Brazil, based on more precise and robust ages (from stepped heating ^{40}Ar - ^{39}Ar and TIMS U-Pb baddeleyite dating) indicate that it was formed over a short period (< 3 Ma), and are consistent with a northward migration of magmatism shown by stratigraphic relationships from both outcrop and borehole information.

Recent ID-TIMS U-Pb baddeleyite-zircon dating of high-TiO₂, high-Sr dykes from the southern FDS yielded ages of 134.7 ± 0.3 and 133.9 ± 0.7 Ma (2σ), indicating that they are contemporaneous with and probably the feeders of the geochemically similar Urubici-type lavas, some of the earliest PMPE flows.

We present here the first results of ID-TIMS U-Pb baddeleyite dating of diabase dykes of the PGDS that cut the Precambrian crystalline basement in the region of the Guapiara Lineament, Vale do Ribeira (SP- PR). The diabase dykes, composed of plagioclase, augite, pigeonite, Fe-Ti oxides, minor fayalitic olivine and interstitial granophyres, are chemically similar to basalts from the northern part of the PMPE (Pitanga and Paranapanema types), showing high Ti (up to 4.5 wt%) and variable Sr (430-890 ppm). Preliminary U-Pb baddeleyite ages are 131.4 ± 0.5 Ma and 131.5 ± 0.4 Ma (1σ), within the same range of previously reported ^{40}Ar - ^{39}Ar ages by stepped heating (133.1 ± 0.5 to 130.8 ± 0.4 Ma), confirming a good coherency between the two chronometers. These results are consistent with the interpretation that the PDGS are younger than the FDS, not validating the triple junction model, and supporting the idea of northward migration of the Paraná tholeiitic magmatism.

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Key words: Paraná-Etendeka Magmatic Province; Ponta Grossa Dyke Swarm; U-Pb baddeleyite dating.