Geochronology of deep-drill-core samples from the basement of the southernmost portion of Paraná Basin (Uruguay)

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The Paraná Basin, located in the central-eastern region of South America, is a large area which extends approximately 1.5 x10^6 km^2 through part of Brazil, Paraguay, Argentina and Uruguay [1]. It is of intracratonic type, being supported by a cratonic basement since its inception [2]. The Paraná Basin holds a volcano-sedimentary infill close to 7,000 m thick with ages from Devonian to Late Cretaceous [3]. The model about the nature of the Paraná basement in its southernmost portion includes the Palaeoproterozoic Piedra Alta Terrane, and the Archean to Neoproterozoic Nico Pérez Terrane, both separated by the N-S Sarandí del Yi shearzone in the exposed areas. Based on geophysical data, the trace of this shearzone in the basin is blurred by the infill; as a consecuence, at least two hypotheses about its position has been stated [4][5]. To test these hypotheses, we conduct a geochronologic analyses by zircon U-Pb LA-ICP-MS of samples recovered from eight deep wells (depth between 1000 to 2000 m) and located between the two possible traces. All the samples analized are granitoids with high K-calc-alkaline, metaluminous to peraluminous nature. The results showed that the ages obtained for the samples located between the two possible traces of Sarandí del Yi shearzone span from 2671 ± 15 Ma to 572.1 ± 4.9 Ma. These results point out that the trace is deflected to N-NW instead of N-S in the basin area, supporting the proposal of [5]. Based on this, it is discarded the existence of the Piedra Alta Terrane as the Paraná basement in that particular portion, and the limits of these terranes need to be revisited.

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