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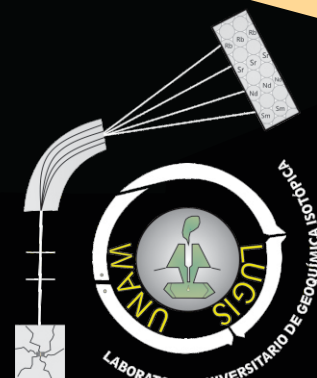
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PROGRAM AND ABSTRACTS



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THE AGE OF THE PARANÁ-ETENDEKA IGNEOUS PROVINCE: AN UPDATE.

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The Paraná-Etendeka igneous province (PEIP) is one of the largest exposures of continental flood lavas formed in Cretaceous and related to the Gondwana breakup. The volcanic field is asymmetrically distributed between South America and Africa with the overwhelming majority of lavas exposed in the Brazilian territory. Volcanic rocks are mainly tholeiitic basalts and basaltic andesites, and minor occurrence of silicic rocks described across the dacite-trachyte-rhyolite fields. As found for other Gondwana igneous provinces, the flood lavas in the PEIP are classified into low-Ti and high-Ti geochemical groups which, in turn, have been subdivided into distinct magma types based on specific geochemical and isotopic criteria. Gramado and Esmeralda magma types represent the low-Ti basaltic lavas exposed in the southern domain of the province, while the Palmas type is considered the silicic equivalent. The high-Ti magmas are by far the dominant geochemical group in the central and northern domains, being represented by the Pitanga and Paranapanema basalts and Chapecó rhyolites. Two other volumetrically subordinate types are the “high-Ti” Urubici and “low-Ti” Ribeira basalts. Volcanic rocks with similar compositions have been documented in the African counterpart.

The age of volcanism in the PEIP and related intrusive rocks has long been studied by the $^{40}\text{Ar}/^{39}\text{Ar}$ method, the bulk of the data published in the 90s decade and, therefore, referenced to outdated calibrations. Here, we update and compare a significant number of $^{40}\text{Ar}/^{39}\text{Ar}$ ages obtained for lava flows, dykes and intrusive complexes based on the optimized calibration recommended by Renne et al. (2011, *Geochim. Cosmochim. Acta*). The updated results allowed us to refine the chronology of the different magmatic types of the province. The low-Ti magmas (Gramado and Palmas) are the oldest units, erupting ~1 m.y. earlier (~135 Ma) than the widespread outpouring of the high-Ti Paranapanema and Pitanga basalts (134-133 Ma). The Chapecó rhyolites and the Urubici basalts were essentially coeval with the low-Ti volcanism. Cessation of the main period of flood volcanism is now established at approximately 133 Ma, along with the onset of magma flowing in the Ponta Grossa dyke swarm. The $^{40}\text{Ar}/^{39}\text{Ar}$ ages of these dykes are mostly concentrated at 133-132 Ma, with a few younger ages progressing onwards, up to 121 Ma. Overall, these results allow us to conclude that the PEIP magmatic activity lasted between 135 and 132 Ma, with a revised mean age of 134.1 Ma for eruption of the flood basalts and rhyolites. This mean age matches with the Late Valanginian–Early Hauterivian boundary, a period marked by important positive ^{13}C -excursion in marine sediments caused by global warming associated to emission of greenhouse gases. As a group, the $^{40}\text{Ar}/^{39}\text{Ar}$ data also cluster to define two age migration patterns, towards north and west. These migrations are not easily correlated to a ‘pure’ mantle plume model requiring that alternative mechanism(s) should be envisaged to explain such combined age distribution of the PEIP flood volcanism.