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Post-Obduction History Of New Caledonia: New Temporal Constraints From Goethite (U-Th)/He Dating Of Duricrusts In Reworked Laterites.

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New-Caledonia is an archipelago from Southern Pacific where a third of the whole surface is covered by ultramafic rocks due to obduction at ca 34 Ma. In contrast with the pre-Oligocene geological history, the post-obduction evolution is not time-constrained. Accordingly, the Neogene and Quaternary paleoenvironmental and paleoclimatic evolution of this diversity hotspot is still poorly known.

The Fluvio-lacustrine Formation of southern New-Caledonia is an intra-mountain sedimentary system, the overall sedimentological features point to a fluvial depositional environment with dominant floodplain and subordinate channel sequences. It consists of a basal conglomerate containing peridotite and iron crust boulders (≤ 1 m) a few m thick, and an overlying fining upward (sand to clay size) sequence of reworked iron-rich lateritic material, 50 to 80m thick at most. Occasional light-colored clay levels (kaolinite and nontronite) are also observed. The whole sequence displays evidence for intra-formational iron mobility (pseudo-layering) and locally contains dense horizons of fossil roots or stumps and fossil leaves. The top of the sequence consists of an iron crust, a few dm or m thick, providing evidence for post-depositional weathering. Such features could potentially enlighten the paleo-environmental conditions that prevailed in southern New-Caledonia after the obduction; however, this was still impossible due to the lack of geochronological constraints.

In this contribution, we shall present a new goethite (U-Th)/He geochronological dataset obtained on iron duricrust pebbles from the base of the sequence and samples from its overlying duricrusts, all from outcrops of the Fluvio-lacustrine System. The obtained ages will then be discussed in term of paleoenvironmental and climatic conditions by considering the sedimentary organization and structure as well as the regional geomorphology.

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