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Ferricretes in New Caledonia: synthesis of age constraints by paleomagnetic and radiometric techniques. Implication on the morphogenesis of 'Grande Terre'

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Although the description of the emplacement and the weathering of the New Caledonia peridotites are well documented, the reconstruction of the planation surfaces formed upon the ultrabasic massifs are poorly documented. Ambiguities remain on the timing and modality of weathering and related supergene nickel ore. The weathering being still active on the peridotites in the current differentiated landscape and tropical climate, the beginning of the ferruginisation is estimated to have occurred between 34 Ma (end of the obduction) or 25 Ma (last granitic intrusions) and present. The data and interpretations presented here are based on paleomagnetic analysis of lateritic ferricretes of Goro and Tiébaghi and radiometric datings obtained by K/Ar on Mn oxides from the Saint-Louis granite weathering profile. In Tiébaghi an age of 25 Ma has been obtained along a section crossing the plateau. Well constrained ages of 0-5 Ma to 25 Ma have been obtained in Goro, highlighting possible stepped paleosurfaces. A consistent age of 18.25 ± 0.6 Ma has been obtained at Saint-Louis. The Tiébaghi Massif displays a single episode of ferricrete development during latest Oligocene times, whereas the Goro site reveals several episodes of ferricrete development from latest Oligocene to Pliocene–Quaternary times, the weathering of the Saint-Louis granite being recorded in between. These data allow to constrain the post-obduction morphogenesis of New Caledonia since uplift probably prevented regolith development until latest Oligocene times. Moreover, the later uplift and deep erosion of the West Coast klippen during the Early Miocene probably prevented further regolith preservation.