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# East Antarctica and supercontinent configuration: the Dronning Maud Land perspective

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The geology of East Antarctica and its correlation in major supercontinents is highly speculative, since only a very small part of it is exposed. Therefore a better connection between geology and geophysics is needed in order to correlate exposed regions with ice-covered, geophysically-defined, blocks. In Dronning Maud Land (DML), two distinct late Mesoproterozoic/early Neoproterozoic tectono-metamorphic provinces appear, separated by the major, NE-trending Forster Magnetic Anomaly and South Orvin Shear Zone. To the west of this lineament, the Maud Belt has clear affinities with Grenville-age continent-continent mobile belts. East of the Forster Magnetic Anomaly, juvenile rocks with early Neoproterozoic age (Rayner-age) and an accretionary character crop out. The international GEA-II expedition (2012) targeted a white spot on the geological map immediately to the E of the Forster Magnetic Anomaly. This area allows the characterization and ground-truthing of a large and mostly ice-covered region, the SE DML Province that had previously been interpreted as an older cratonic block. However, new SHRIMP/SIMS zircon analyses and their geochemistry indicates that the exposed basement consists of a ca. 1000-900 Ma juvenile terrane that is very similar to rocks in Sor Rondane. It lacks significant metamorphic overprint at the end of crust formation, but it shows medium to high-grade overprinting between ca. 630-520 Ma, associated with significant felsic melt production, including A-type granitoid magmatism. Therefore, the aeromagnetically distinct SE DML province does neither represent the foreland of a Late Neoproterozoic/EarlyPaleozoic mobile belt, nor a craton, as has previously been speculated. It more likely represents the more juvenile, westward continuation of Rayner-age crust (1000-900 Ma). To the west it abuts along the NE-trending Forster Magnetic Anomaly. The latter is interpreted as a suture, which separates typical Grenville-age crust of the Maud Belt (ca. 1200-1030 Ma) to the W from Rayner-age crust to the E. Therefore the larger eastern part of DML has clearly Indian affinities. Its juvenile character with a lack of metamorphic overprint at the end of crust formation points to an accretionary history along this part of the Indian segment of Rodinia, immediately following final Rodinia assembly.

Keywords: Dronning Maud Land, Forster Magnetic Anomaly, supercontinents, juvenile crust, early Neoproterozoic, suture zone