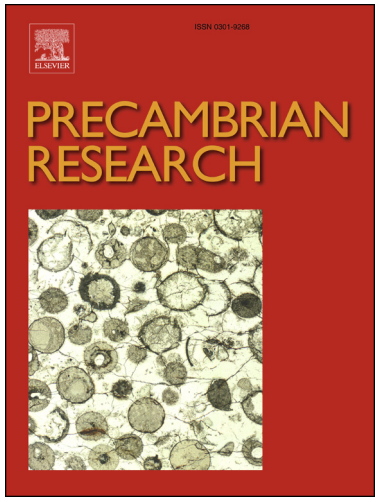

Precise microbeam dating defines three Archaean granitoid suites at the south-western margin of the Kaapvaal Craton

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Precise microbeam dating defines three Archaean granitoid suites at the southwestern margin of the Kaapvaal Craton.

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ABSTRACT

Precise microbeam U-Pb zircon dates have been determined for 17 granitoid samples which crop out along the southwestern margin of the Kaapvaal Craton. In the Marydale High two main types of granitoid are distinguished mainly by their normative Quartz - Alkali Feldspar – Plagioclase mineral proportions. The Draghoender Granite type is generally tonalitic to trondhjemitic and some samples have very low heavy Rare Earth Elements, probably originating as melts of eclogitic protoliths. Their ages vary by ~50 Ma from 2946 ±9 Ma to 2892 ±6 Ma (2σ), reflecting a long period of magmatism possibly due to subduction. The granodioritic to monzogranitic Skalkseput Granite type intrudes the Draghoender granite in places and has a coherent age of 2901 ±14 Ma. These two granite types thus overlap in time and space. The more evolved Skalkseputs type could have been derived by melting of the Draghoender type during assembly of the Kaapvaal Craton by collision of the Kimberley and Witwatersrand Terranes.

A third granite type is exemplified by the 2721 ±6 Ma monzogranitic Steenkop Granite Gneiss which occurs south of Prieskapoort, and corresponds in age to a 2718 ±8 Ma monzogranite dyke which intrudes a 2871 Ma Skalkseput monzogranite. The previous age of 2718 ±8 Ma for the Skalkseput Granite probably also dated a Steenkop-type dyke. A basal conglomerate to the Zeekoebaard Formation of the Ventersdorp Supergroup has a single 2720 ±4 Ma detrital zircon population.

South of the Marydale High a narrow strip of Draghoender-type Granite extends to Franzenhof where it is exposed in a Dwyka glacial outwash surface and is dated at 2931 ±9