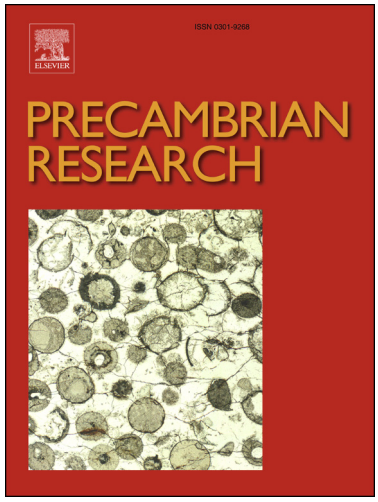

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New detrital zircon age and trace element evidence for 1450 Ma igneous zircon sources in East Antarctica

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Abstract

U-Pb detrital zircon age and trace element data from a Devonian sandstone sample of the Beacon Supergroup provide new evidence for 1450 Ma zircon sources in Antarctica. These grains yield a dominant 1450 Ma (Mesoproterozoic, Calymmian) age probability peak with U/Th ratios suggesting they primarily formed from magmatic processes, also consistent with the presence of grains with oscillatory zonation. Determination of zircon parent rock types using trace element proxies reveals that the zircon grains are likely predominantly derived from granitoid rocks, with subsidiary, yet significant contributions from mafic and alkaline igneous rocks. These results are consistent with a ca. 1440 Ma (Mesoproterozoic, Calymmian) granitoid glacial erratic and similar aged detrital zircon found elsewhere in the Transantarctic Mountains that suggest a continuation of the trans-Laurentian A-type granitoid belt into Antarctica and, therefore, a 1400 Ma SWEAT-like reconstruction of the continental landmasses.

Keywords: Detrital zircon; U-Pb age; trace element; rock type; supercontinent

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