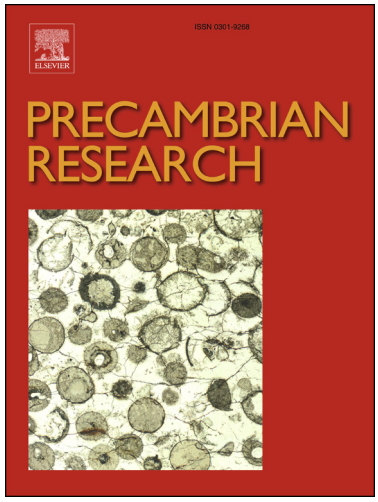

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Ross B. Kielman, Alexander A. Nemchin, Martin J. Whitehouse, Robert T. Pidgeon, Jeremy J. Bellucci

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U-Pb age distribution recorded in zircons from Archean quartzites in the Mt. Alfred area, Yilgarn Craton, Western Australia

Ross B. Kielman[a*], Alexander A. Nemchin[a,b], Martin J. Whitehouse[a], Robert T. Pidgeon[b], Jeremy J. Bellucci[a]

[a] Department of Geosciences, Swedish Museum of Natural History, SE-104 05 Stockholm, Sweden

[b] Department of Applied Geology, Curtin University, Perth, WA 6845, Australia

*Corresponding author, ross.kielman@nrm.se

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Abstract

The U-Th-Pb isotopic data from detrital zircon grains from five samples of Archean quartzite from the Mt. Alfred area of the Illaara greenstone belt in the Yilgarn Craton of Western Australia are presented in this study. The zircon grains are typically fractured and contain both irregular and oscillatory zoned internal structures as revealed by cathodoluminescence imaging. Concordant $^{207}Pb/^{206}Pb$ ages range between 3109 ± 17 and 3918 ± 16 Ma (2σ), with three main age peaks at ca. 3640, 3690 and 3760 Ma. Older $^{207}Pb/^{206}Pb$ ages up to 4067 ± 5 Ma are strongly affected by at least one recent disturbance event, however one single-grain discordia yields an upper intercept age of 4107 ± 12 (MSWD = 1.2). A further sixteen zircon grains with multiple analyses define discordia that suggest U-Pb disturbance events in the Neoarchean and the Mesozoic, the latter as a result of invasive low temperature weathering solutions. The notable lack of grains with ages less than ~3.6 Ga in the Mt. Alfred detrital zircon population differentiates it from other quartzite