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$^{40}Ar/^{39}Ar$ ages of muscovite from the Cape Fold Belt, South Africa and their implications for understanding the Cape-Karoo system.

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South Africa's Cape Fold Belt, and the Karoo Foreland Basin are an excellent natural laboratory to study fold-thrust belt and foreland basin development, but the sedimentary and low grade metamorphic nature of the region presents some challenges to deciphering its history. We set out to better constrain the timing of Cape Orogeny and the framework of the Cape-Karoo system by handpicking muscovite from sheared Cape Supergroup rocks for argon isotopic analysis. Nine new argon plateau ages and two mini plateau ages of handpicked muscovite from Cape Supergroup rocks are interpreted to represent ages of cooling (248±2 Ma to 254.6±2.1 Ma; n=4), deformation (261±3 Ma to 276±5 Ma; n=4), as well as unreset detrital grains (>400 Ma, n=3) [1].

Our results indicate a shorter duration of orogenesis than earlier bulk-rock argon age data had suggested. The ages provide a temporal boundary condition for the onset of continental sedimentation in the Karoo Basin and can be used to scrutinize the interpretation of ashbed zircon ages found in deformed strata of the Karoo Supergroup [2]. The new Cape Fold Belt ages also provide important information for deciphering the teconic history of this segment of Gondwana's margin. While our results indicate that muscovite ages taken from deformed Karoo Supergroup strata will preserve a detrital age signature, clay ages taken from these rocks (from illite) would likely reveal the progress of deformation northward beyond exposed outcrops of Cape Supergroup rocks.

References:

[1] Hansma J et al. (2015) Gondwana Research, doi:10.1016/j.gr.2015.02.005

[2] Tohver et al. (2015) Geochemistry, Geophysics, Geosystems 16, doi:10.1002/2015GC005930.