Geophysical Research Abstracts
Vol. 15, EGU2013-791, 2013
EGU General Assembly 2013

Preliminary Palaeomagnetic Results from ICDP Barberton Greenstone Belt Scientific Drill Cores.

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Four drill cores from the ICDP Barberton Greenstone Belt Scientific Drilling Project have been sampled for palaeomagnetic analysis. Some 350 oriented mini-samples (10mm diameter) were collected from cores BARB1 to BARB 4, allowing units from the Onverwacht (Komatii and Hooggenoeg Formations) and Fig Tree Groups to be studied. Previous work has indicated that rocks from the Noisy and Hooggenoeg Formations have the potential to record a near-primary direction of remanence and suggest the presence of a reversing geomagnetic field of similar magnitude to the recent field at ca. 3.5Ga. Previous paleomagnetic studies carried out on the Komatii Formation have yielded one of the oldest paleomagnetic poles and intensities in the world but these results are even more questionable. So far, no paleomagnetic work has been carried out on the Buck Reef Chert Formation or the Fig Tree Group.
This sampling forms part of a larger study aiming, firstly to constrain the reliability of previous results by performing improved field stability tests. A positive fold test would constrain the age of the magnetic signal recorded by the Komatii and Hooggenoeg Formations to older than 3.2 Ga. Confirmation of the presence of a viable and reversing field during the Palaeoarchean would place a strong constraint on processes occurring in the outer core during this time with implications for planetary evolution. Rates of polar wander will also be constrained by the directional findings, shedding some light on mantle convection processes at the time. Preliminary directional work on samples from drill cores will be presented here.