

AGU FALL MEETING

San Francisco | 15–19 December 2014

- T41D-02 Interpretation of Continental Scale Gravity Signatures from GOCE at Smaller Scale Mineral Hosting outcrops

Pa Thursday, December 18, 2014 08:15 AM - 08:30 AM

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The GOCE gravity field is globally homogeneous at the resolution of about 50km or better allowing for the first time to analyze tectonic structures on the continental scale. Geologic correlation studies propose to continue the tectonic lineaments across continents to the pre-breakup position. Tectonic events that induce density changes, as metamorphic events and magmatic events, should then show up in the gravity field. Applying geodynamic plate reconstructions to the GOCE gravity field places today's observed field at the pre-breakup position (Braitenberg, 2014). The same reconstruction can be applied to the seismic velocity models, to allow a joint gravity-velocity analysis. The geophysical fields bear information to control the likeliness of the hypothesized continuation of lineations. Total absence of a signal, makes the cross-continental continuation of the lineament unprobable, as continental-wide lineaments are controlled by rheologic and compositional differences of crust and upper mantle. Special attention is given to Greenstone belts, which are associated to a class of important mineralizations. The outcrops are limited in extent, but are associated with a much broader gravity signature, which cannot be explained by the outcropping masses alone. The gravity requires a mass source residing at lower crustal level, giving evidence of the mantle-crust melting processes influencing the tectonic characteristic at surface. The study is carried out over the African and South American continents.

Reference

Braitenberg C. (2014). Exploration of tectonic structures with GOCE in Africa and across-continents. *International Journal of Applied Earth Observation and Geoinformation*, doi:10.1016/j.jag.2014.013

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