

Gravimetric investigations at the boundary between the Highland Series and the Vijayan Complex, two lower crustal blocks in Sri Lanka

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A smoothed gravity map of Sri Lanka was given by Hatherton *et al.* in 1975, based on 1000 stations (bench marks). The Bouguer anomaly is negative (90 mgal) due to the continental crust of Sri Lanka relative to the surrounding heavier oceanic crust. The area of the Highland Series, is characterized by a positive anomaly of about +10 mgal.

Detailed gravimetric and magnetic field measurements were carried out in 1989 and 1990 to investigate the eastern boundary between the late Archaean granulite-grade units of the Highland Series and the late Proterozoic amphibolite-grade assemblages of the Vijayan Complex along four profiles. The profiles are located (from N to S) at Mahiyangana, Uraniya, Wellawaya and Kataragama. First results from the 50 km E-W oriented profile near Mahiyangana show a positive Bouguer anomaly of about 12 mgal over the Highland Series gneisses in the western part of the profile relative to the migmatites and hornblende-biotite gneisses of the Vijayan Complex in the east. Garnet-sillimanite gneisses are responsible for this positive Bouguer anomaly. The density contrast to the other rock units is about 0.2 g/cm^3 . Two-dimensional modelling indicates that the base of this rock type dips to the west. It seems possible that the thrust plane between Highland and Vijayan units, which was postulated earlier by other authors, is located at the base of the garnet-sillimanite gneisses.

The Bouguer anomalies from the other three profiles are smaller and more complicated in detail. Taking into account the structural field work, the gravimetric results indicate a folded contact between the two different intracrustal rock units. According to the results of the German-Sri Lanka Consortium (GSLC), the intracrustal collision took place during the Pan-African event, between 600 and 460 Ma ago, under conditions of amphibolite-facies metamorphism. It seems clear that a complicated pattern of intense

deformation in the middle to lower crust was the result. The folding of the two units during collision can be related to phase four (F4). We hope to obtain an idea of the configuration of the collision zone by using the gravity data.

REFERENCES

Hatherton, T., Pattiaratchi, D.B., and Ranasinghe, V.V.C., 1975: Gravity map of Sri Lanka 1:1 000 000, Geological Survey Department, Colombo 2, Ministry of Industries and Scientific Affairs.