

CRUST AND UPPER MANTLE STRUCTURE IN THE  
ANTARCTIC REGION DERIVED FROM GRAVITY ANOMALY  
(ABSTRACT)

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The free air gravity anomaly south of 45S was obtained recently by the use of the Antarctic land data measured so far and the sea gravity data derived from the SEASAT and GEOS-3 altimetric geoid. For the purpose of discussing the sub-bottom structure of the whole Antarctic region (including both land and sea areas), Bouguer gravity anomaly was calculated from the free air anomaly thus obtained and the recently published topographic map.

Bouguer anomaly in the Antarctic continent, especially in East Antarctica, presents negative anomaly, showing that the land area is in isostatic equilibrium with the thick crust supporting the load of both ice sheet and bedrock topography. In the surrounding ocean area exists the zone of relatively negative anomaly corresponding to the mid-ocean ridges, and there is some relationship between the sub-bottom structure of the Ross Sea and that of the mid-ocean ridges.

Wave number analysis of the gravity data was carried out as to the five lines in the land area. The result shows that 1) both crust and lithosphere are thicker in East Antarctica than in West Antarctica, and 2) no clear boundary of lithosphere and asthenosphere is recognized in the Ross Sea, which suggests that the asthenosphere reaches up to the bottom of the crust in this place.

*(Received April 6, 1987)*