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ELECTRICAL STRUCTURE AND ITS IMPLICATION ACROSS THE LOWER- AND UPPER-CRUSTAL SETTINGS OF SOUTH INDIA, **U.Raval, National Geophysical Research Institute, Hyderabad-500007, India.**

Measurements of a large scale MMA experiment covering both the granulite and greenstone terrains of Archeans in the southern part of India is re-visited and re-analysed. The induced field variations contain the signatures of crustal and subcrustal electrical conductivities, although substantially distorted by the sea-land interfaces and cenozoic sediments. However, through a selection of some reconnaissance profiles and temporal variations, an attempt is made to deduce whether (i) significant differences exist between the electrical structures of the high and low grade complexes i.e. if the electrical conductivity of the lower crust is due to minerological composition or is intrinsic to the positioning at depths (> 15 km), (ii) the probable seaward extension of the continental crust and its transition to oceanic type may also contribute (through intracrustal DC-like telluric sheets) to the induction field in addition to or rather than the sharply localized zones, (iii) the observed parameters are indicative of a formal anisotropy and/or undulations in the deep crust, and (iv) the postulate of relatively hotter Indian shield is reflected particularly with regard to differential metamorphism. In the last case, the crust-mantle coupling in this region - unlike other similar areas - seems to be markedly affected by the evolution of NE-plate velocity field.

Thus the possible heating due to shear at the litho-asthenosphere boundary and difference in the rheological response of the two types of crustal zones provide some clues for the observed uplifts, unloading and other tectonic elements. For example, the Palghat gap may be due to thermomechanical adjustments in response to the secular changes in the regional stress regimes. The response modification noticed at some central stations which lie near the vicinity of the transition may be due to intracrustal overlapping implying presence of fluid at possible dipping contacts or to non-uniform metamorphism. Some model results are also presented to emphasise (a) above points in conjunction with available geophysical information and (b) MT coverage of this window to the lower-crust and underlying mantle.

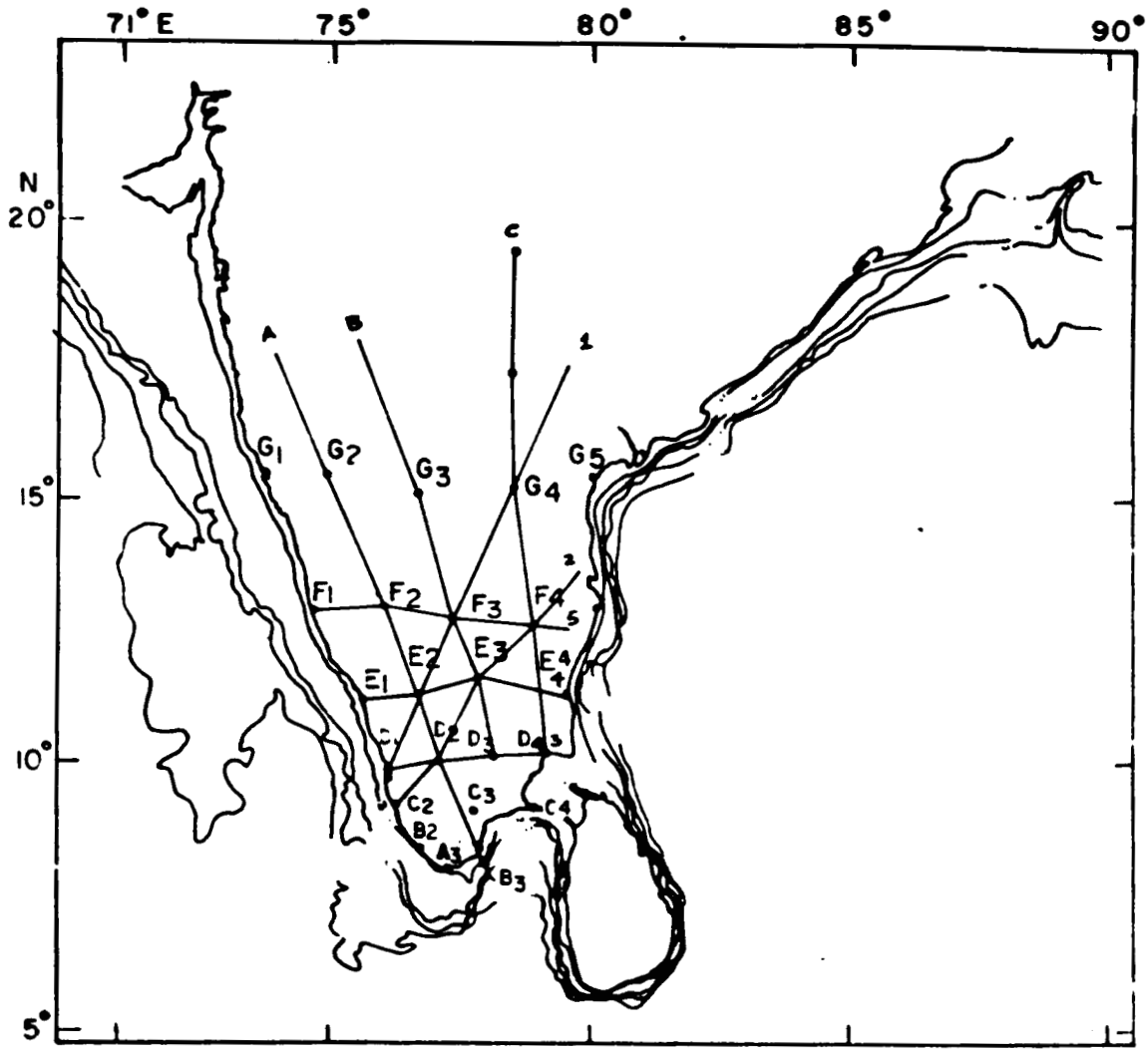

Fig.1. MMA stations of the GDS experiment and selected reconnaissance profile over the greenstone-granulite terrains.

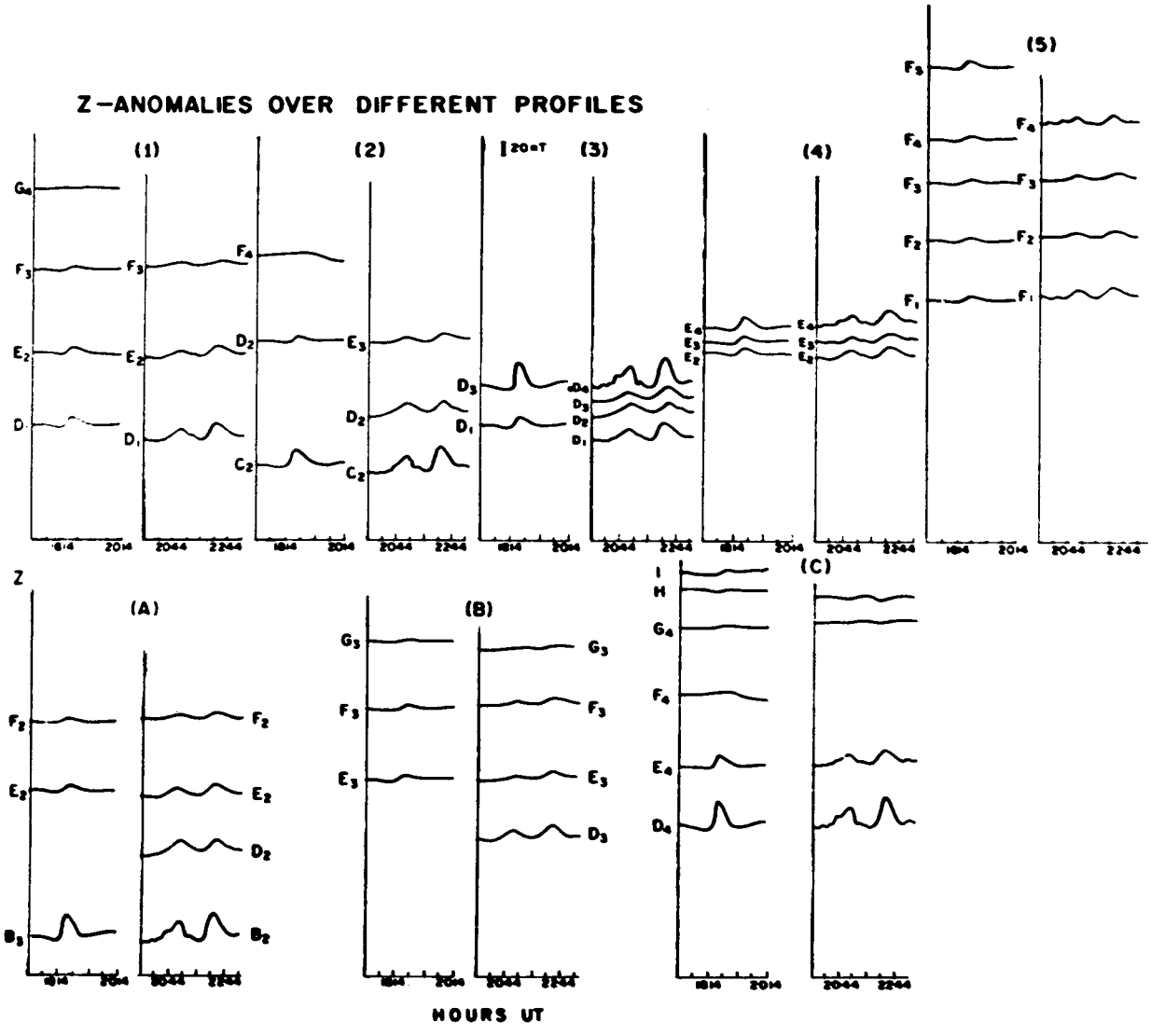

Fig.2. Z-response over the selected profiles (Fig.1).