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Deep Geoelectric structure of the lithosphere over Barak Valley region, Indo-Myanmar Orogen

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Abstract:

The Indo-Myanmar orogen is a crescent shaped belt characterized by parallel ridges and valleys and tightly appressed folds with parallel drainage and dissected topography. The Barak Valley lies on the western flank of Indo-Myanmar orogen and is bounded by latitude 24° 42' 30" and 24° 53' 30" N and longitude 92° 10' 27" and 93° 10' 28" E, has a thick piles of Tertiary and Quaternary sediments of marine to deltaic and marginal marine to fluvial environments over a cretaceous basal layer. The westerly convex sinuous structural ridges and valleys with sub meridional trend subjacent to the Arakan Yoma suture zone generated by the east ward drift of the Indian plate during Neogene.

The crustal geometry of the Barak valley is inferred from an electrical resistivity model obtained from broadband magnetotelluric (MT) data acquired along twelve sites. The valley filled with continental sedimentary rocks has evolved under E- W compressive stress field, initially responded by a folding episode having broadly N-S axial planes and later by conjugate set of strike slip faulting episode. The E- W profile between Jiribam (Tamenglong) and Sutatkandi (Karimganj), around 92 km long that cut across the Barak valley was chosen for the MT field work.

The MT time series data obtained using the KMS 820 is transformed, processed, interfaced, decomposed, constrained and inverted to get the geoelectric structure along the profile. The geoelectric crustal structure upto 30 km depth was delineated. The model highlights an undulating resistive layer of 100 – 200 Ω m at a depth of 6 – 20 km beneath a relatively conductive 10 – 15 Ω m layer running almost parallel all along the profile that reflects the compressive nature of the deeper crust. The detail analysis is being carried out for further interpretation.

Keywords: Magnetotellurics, Geo-electric structure, Barak Valley, Indo- Myanmar orogen

