

Mid crustal conductivity anomaly of the Ribeira fold belt, SE Brazil

1FONTES, S.L., 1FIGUEIREDO, I., 2BRITO, P.M.A., 2VITORELLO, I., 2PADILHA, A.L. 1CNPq/ON, Rio de Janeiro, Brazil; 2INPE, S.J. Campos, Brazil.

Seventy one magnetotelluric soundings in the period range from 0.01 to 1000 s were carried out along two NW parallel profiles placed apart at a 300 km distance, across the NE trending Serra do Mar and Serra da Mantiqueira plateau mountains, relics of uplifted and eroded surfaces of the Ribeira fold belt in SE Brazil. Data were processed using robust techniques and further analyzed using decomposition methods in order to obtain the regional azimuth which was found to be coincident with the regional geological strike. By using smooth inversion programs, a 2-D modeling was performed on both profiles and resolved a moderately conductive horizontal layer at a depth around 10 km (conductances of 10 S and 100 S in the southwestern and northeastern profiles, respectively). Deep crustal zones of enhanced conductivity have been reported in very distinct tectonic settings of the world but the assigned explanations, based on interconnected carbon films and saline fluids, remain in dispute. The tectonic history of the studied region indicates as likely events that might have favored the build up or the maintenance of the detected regional anomaly: (i) the Brasiliano-Pan African Orogeny over reworked Transamazonian basement; (ii) a crust/lithosphere stretching and thinning during the South Atlantic break-up; (iii) onshore flexure-tail related to continent-ocean transitions; and (iv) crustal stresses in passive continental margins associated with plate driving or drag forces.