Crustal structure across Indus Tsangpo Suture zone NW Himalaya, India as revealed from Magnetotelluric study

C.K. Rao

Adhiraj Gardens, Kharghar, Navi Mumbai

Abstract:

Broad band magnetotelluric (MT) data were acquired at 18 stations along NE-SW profile crossing Tso Morari and Indus Tsangpo (ITS) suture in NW Himalayan region. Regional strike analysis indicates the MT data is consistent with an assumption of 2D geoelectric strike direction. The regional strike indicates $N40^0W$ and correlates well with the observed predominant geological strike of the region. The galvanic distortion corrected data were inverted with 2D inversion code for obtaining geoelectric model of the study region. The geoelectric section broadly reflects the resistivity pattern typically observed over Indus Tsangpo suture in other parts of Himalaya. A low resistivity zone of 20 km thick and 15 km wide with resistivity less than 2 Ohm-m is delineated corresponds to ITS is flanked on either sides by the high resistivity bodies. The high resistivity bodies corresponds to Rupshi granite on SW of ITS and Ladakh batholith and Chusul granite on the NE. Studies in different parts of ITS indicate that the low resistivity is a regional feature extending over the entire 2500 km length of Himalaya. The low resistivity observed in the present study is attributed to either saline fluids or partial melts of the rocks due to high temperature regime in deeper crust, and also the frictional heat generated in the process of Indian Plate sliding across the Tibetan block. The high surface heat flow of 180 mW/sq.m in the region suggest that most of contribution to the observed low resistivity is of thermal origin.