AOGS 2005

Role of Fluids in existence of Upper Mantle Conducting Layer in Lesser Himalayan Region

V.K. RAO, SUBRATA K.BHUKTA and HC. TEWARI
National Geophysical Research Institute, Uppal Road, Hyderabad-500 007, India

The lesser Himalayan region consists of many thrust zones due to the collision and continuous subsidence of the Indian plate with the Eurasian plate. Several workers have mapped conductors in the crust of lesser Himalayas. We explain the genesis of the crustal suggest the presence of an upper mantle conductor. These conductors may be linked with the fluid. The genesis of fluid is in the collision zones at the contacts of orthogonal structures of the Indian plate. The subject of fluid process should be generalized in the backdrop of magma underplating. We have come forward with the concept of magma underplating that correlates to the presence of lower crustal conductors in the collision zone of the Lesser Himalayas. These conductors are likely to have a linkage with the upper mantle in the form of partial melts. The collision of the high density Delhi-Aravalli Fold Belt (DAFB), crust in a strike slip environment, generated fluid zones in the upper mantle across the lesser Himalayas. The presence of these fluids in the upper mantle is influencing the physical and chemical properties at the Moho and are culminating in high conductivity, seismic stresses etc.
The Poisson ration gives the valu of 0.27 for the upper mantle in the Nepal region, which can be taken for our study region as well,because both the regions are in the lesser Himalayas. In a conductive zone, it is likely to be associated with partially serpentinised rocks because there is a progressive change of Poisson's ration from 0.25 to 0.36, as duntie is hydrated to serpentinite. The existence of serpentinites in the upper mantle thus seems to be promising because its hydration can explain the upper mantle conductor. Because continued subduction and the collision results in the delamination of the crust into the upper mantle. In the delamination process, change in the mineral. Mineral phase change is mainly responsible for generating upper mantle conducting layer (e.g. Olivine-Spinel).