

Conductivity anomalies in and around the Korean Peninsula

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ABSTRACT

The geomagnetic depth sounding (GDS) has been carried out to examine conductivity anomalies in and around the Korean Peninsula. In this study, twelve GDS data were newly acquired in middle-western area of the peninsula and integrated into the previous seventeen GDS data. In order to quantitatively interpret observed real induction arrows, 3-D MT modeling considering the surrounding seas of the Korean Peninsula has been performed. Comparison of the observed and the calculated real induction arrows revealed the followings: 1) For the period of 3600 sec, the influence of the East Sea is greatly predominant and there is little difference between the observed and calculated arrows in most of sites. 2) For the period of 600s, but there exist observation sites where the observed arrows were not fully resolved by the sea effect alone. These phenomena imply that the observed induction arrows are due to some combined effects of the sea and other conductive structures in and around the peninsula. Based on previous geological and geophysical studies, two conductive structures were proposed as feasible conductive structures. One is the Imjingang Belt, which is thought as an extension of Quiling-Dabie-Sulu continental collision belt. The effects of the Imjingang Belt clearly appeared at the YIN, ICHN, and several middle-western sites. The other is the HCL (Highly Conductive Layer), which is considered as a conductive anomaly by mantle upwelling produced in back-basin region. The effects of the HCL exhibited well at the KZU, KMT101, and KMT 107 sites in the south-eastern area of the peninsula.