BELT STRUCTURE OF THE KOREAN PENINSULA BY GDS and TELESEISMIC DATA

지자기 심부탐사와 원거리 지진자료에 의한 한반도 구조대 해석

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ABSTRACT

We have performed a geomagnetic depth sounding (GDS) and analyzed the data in terms of induction arrows to investigate the deep electrical structure in and around the Korean Peninsula between Japan, the tectonic boundary of Pacific Ocean, and China, where intra-plate earthquakes have been frequently occurring. And teleseismic data were analyzed to see the variance of travel-time delay at each station. The GDS results strongly suggest evidence to elucidate relations between the tectonic tension and the deep electrical structurein this area. The inland anomalous pattern of induction arrows appears to indicate the direction of NE-SW, which is similar to that of the axis of tectonic compression of this area. Especially, the results of observations in the middle of the peninsula imply an anomalous pattern on the tectonic area near the Imjin River Belt, thought of as an extension of the Qinling-Dabie-Shandong continent collision belt of Eastern China. Induction arrows in the mid-southern area appear to be related with the thick sediment layer, called the Ogcheon Belt, thatis another tectonic boundary in the Korean Peninsula. The sea effect is very weak in the west coastal line and it makes it possible to interpret various anomalous zones near the coastal region. However it was difficult to convince that the pattern, which showed southwardarrows similar to the previous study along the southern coastline of the peninsula and Jeju Island near Kyushu, Japan,

is indicating highly conductive anomalies (HCL). A three-dimensional (3-D) magnetotelluric (MT) modeling technique was adopted to compare with the sea effect and infer the deep structure. The teleseismic data implies that the anomalous depth of the Ogcheon belt is not significantly deep. On the other hand, the delay anomaly appearsin the Imjin River Belt area and it proposes the Imjin Belt is more probable as a collision belt than Ogcheon Belt.

Keywords: GDS, teleseismic, tectonic boundary, geoelectrical structure, 3-D MT modeling