# Spatial extension of mid-mantle high conductivity layer beneath northeastern China

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Northeastern China is located in the back-arc region of the NW-Pacific subduction system. Recent seismic tomography studies revealed a high velocity layer lying in the mantle transition zone beyond the Wadati-Benioff zone beneath the back-arc region of East Asia (e.g. Fukao, 2002). The layer was interpreted as a stagnant subducted slab in the mantle transition zone. Besides, there prevails Neocene to Quaternary volcanic activity in NE China, which coincidently overlies the high velocity anomaly region. In order to get deeper insights on these relationships between seismic structures and volcanic activities, and aiming at giving independent information of the substructure, we have performed series of Network-MT and GDS surveys in NE China.

The Network-MT survey uses metallic telephone lines to measure long baseline voltage differences. The method is most suited for elucidating deep and regional scale electrical conductivity structure (Uyeshima et al., 2001). The Network-MT with GDS research in Jilin province (Ichiki et al., 2001) revealed that the mantle transition zone is about one order more conductive than those beneath Carty Lake in the Canadian shield and tectonically active areas such as Tucson in the southwestern US and Honolulu in the north central Pacific. We ascribed this high conductivity most probably to the presence of water in the stagnant slab. Then, as a next step, we extended the survey area to the south of Jilin province and carried out the Network-MT observations in Liaoning province to delineate lateral variations in electrical conductivity in the mantle transition zone.

Comparing the conductivity structures in Liaoning province with those in Jilin province, we found that the mantle transition zone in Liaoning is by several factor less conductive than in Jilin. In Jilin, impedance phase starts to enhance at 10^4 s and it becomes almost 80 degree in the period range between 10^4 and 10^5 s, whereas, enhancement of phase is less remarkable especially in southern part of Liaoning. This difference in impedance phase results in the difference in conductivity structure. The seismic tomography research revealed the spatial extent of the staganant slab. According to the seismic structure, horizontal width of the stagnant slab narrows in Lianing province. Thus the difference in electrical conductivity structure between Liaoning and Jilin province may be related to the narrow stagnant slab in Liaoning.