Interpretation of the high conductive anomaly of the Society hotspot

N. TADA[1]*, P. TARITS[2], K. BABA[3], H. UTADA[3], D. SUETSUGU[1]

[1]Japan Agency for Marine-Earth Science and Technology, Yokosuka 237-0061, Japan (*correspondence: norikot@jamstec.go.jp)

[2]UMR-Domaines Océaniques, IUEM, Plouzané F29280, France

[3]Earthquake Research Institute, The University of Tokyo, Tokyo 113-0032, Japan

A large-scale mantle upwelling beneath the French Polynesia region in the South Pacific has been suggested from seismic studies, and a slow velocity anomaly continues from the core mantle boundary to the upper mantle just beneath the Society hotspot [1]. However, the previous studies [1, 2] are not enough to understand the geometry, temperature, and composition of the Society hotspot. Then, we carried out the TIARES project that composed of multi-sensor stations including BBOBSs, OBEMs, and DPGs from 2009 to 2010 [3].

We have analyzed marine magnetotelluric data obtained totally 20 sites around the Society hotspot, and revealed a three-dimensional shaped high conductive anomaly, like a thumb, beneath the Society hotspot. In order to clarify the cause of the high conductivity, water content, melt fraction, and H_2O and CO_2 contents in the upper mantle were estimated by adopting results of rock experiments at high temperatures and pressures. As a result, the upper mantle in the high conductive anomaly involves more melt, H_2O, and CO_2 rather than that in the surrounding area. Furthermore, temperature of high conductive anomaly might be higher than the surrounding area. It appears that a large amount of fluid and temperature transfer through the plume.

[1] Suetsugu *et al*. (2009) Geochem. Geophys. Geosyst. **10**, Q11014, doi:10.1029/2009GC002533. [2] Nolasco *et al*. (1998) JGR **103**, 30287-30309. [3] Suetsugu *et al*. (2012) EPS **64**, i-iv.