スタティックシフトを考慮した東北地方庄内平野の三次元比抵抗構造

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3D resistivity structure beneath Shonai plain northwestern part of Honshu, taking account of galvanic distortion of electric field

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The dehydrated fluid from a subducted oceanic plate is estimated to be localized in the crust and the upper mantle in the tectonic zone. To clarify the image and the mechanism of the tectonic zone, our electromagnetic group in the Hizumi project conducted wideband magnetotelluric (MT) surveys in the northeastern margin of Japan sea tectonic zone since 2008 to 2011. We performed 6 survey lines with 82 sites. At first, we estimated 2D resistivity structure at each line by using a 2D inversion code (Ogawa and Uchida, 1996). The 2D models from TE and TM modes show characteristic conductive part above -5 km ASL in the Shonai plane, and beneath -10 km ASL at the eastern part of Mt. Gassan. The strike directions, however, estimated from phase tensor analysis (Caldwell et al., 2004) are different in the upper and lower part, and some of induction allows estimated by tipper responses did not imply 2D structure. Therefore, we performed 3D analysis by using the inversion code of WSINV3DMT (Siripunvaraporn and Egbert, 2009). An estimated resistivity structure by using the 3D code is totally different from the structure of 2D's. At first, it was thought that the discrepancy was derived from the difference of dimension analysis (2D/3D). However, after using geomagnetic deep sounding (GDS) for the resistivity analysis, we can find that heavy static shift effects are included in the observed data. In this study, we estimated distortion matrix (Cdis) from comparison between the observed impedance (Zobs) and impedance from GDS response (Zopt), and will discuss the way of removing static shift in the 3D analysis.