

Effects of source field on MT responses of the flat Earth and the spherical Earth

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Magnetotelluric (MT) method is one of electromagnetic exploration methods using ionospheric and magnetospheric current for source field. Many researchers have discussed the bias of source field on MT responses (e.g., Madden and Nelson, 1964). Such bias should be careful especially in case of the exploration for deep mantle. For the analysis of deep mantle, some studies are undertaken assuming the flat Earth (Baba et al., 2010) and some are assuming the spherical Earth (Grayver et al., 2019). In this study, the MT responses under the flat or spherical Earth when source field is considered are derived. Varying the vertical and horizontal distance from a site, the robustness of MT responses at each coordinate is discussed.

The MT responses when source is considered have been studied by many researches (e.g., Schmucker, 1970). However, the technique of applied mathematics is introduced not enough in the papers. Therefore, at the appendix of poster presentation, such technique is explained.

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