

PROCESSING OF MAGNETOTELLURIC DATA – A COMPARATIVE STUDY WITH 4 AND 6 ELEMENT IMPEDENCE TENSOR ELEMENTS

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Computation of impedance tensor elements is one of the important step in magnetotelluric data processing. Conventionally, the impedance tensor is defined as 2×2 matrix with Z_{xx} , Z_{xy} , Z_{yx} , Z_{yy} as elements. In the present study the 6-element impedance tensor is computed considering Z_{xx} , Z_{xy} , Z_{yx} , Z_{yy} , Z_{xz} , Z_{yz} using 2×3 matrix. In the present study, the properties of the impedance tensor elements have been analysed for the above two types. The methodology has also been tested by considering 5 component magnetotelluric data in a sedimentary basin environment. We compute the apparent resistivity, phase parameters and compared. It is observed that there is no difference for the off-diagonal impedance elements Z_{xy} , Z_{yx} for most of the frequency band. However, for the longer period data, an increase in the apparent resistivity and decrease in the phase is observed for more than 100 sec of data. By close observation of other parameters, tipper magnitude is nearly zero for most of the periods, but gradually showed an increasing trend for longer periods (>100 sec). This indicates that the vertical component of the magnetic field, H_z , does play an important role in the estimation of the MT parameters.

impedance elements, magnetotelluric data processing