



Application of Modified Differential Evolution Algorithm to Magnetotelluric and Vertical Electrical Sounding Data

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In this research, the Modified Differential Evolution (DE) algorithm is proposed and applied to the Magnetotelluric (MT) and Vertical Electrical sounding (VES) data to reveal the reasonable resistivity structure. The common processes of DE algorithm, including initialization, mutation and crossover, are modified by introducing both new control parameters and some constraints to obtain the fitting-reasonable resistivity model. The validity and efficiency of our developed modified DE algorithm is tested on both synthetic and real observed data. Our developed DE algorithm is also compared to the well-known OCCAM's algorithm for real case of MT data. For the synthetic case, our modified DE algorithm with appropriate control parameters can reveal the reasonable-fitting models when compared to the original synthetic models. For the real data case, the resistivity structures revealed by our algorithm are closed to those obtained by OCCAM's inversion, but our obtained structures reveal layers more apparently.