INCORPORATION OF TOPOGRAPHY INTO MODELS USING FINITE DIFFERENCE MODELING WITH TRIANGULAR DISCRETIZATION AND CORRECTION PROCEDURE FOR INVERSION ALGORITHM

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Direct current resistivity data which were collected on rough terrain must be inverted considering topographic effect in order to obtain meaningful results. In this study we focused on developing a new inversion algorithm for direct current resistivity data. In this algorithm we used two different strategies. First, topography is incorporated into the model by using a finite difference technique that requires less computation time than the finite element method. The second strategy was about correction procedure which is used an inversion routine. Unlike the previous studies, where a finite difference forward solution was used, triangular elements were formed by completing the diagonals of the rectangular cells in DCR modeling. This is offering flexibility in model design that is typically only available using the finite element method. These triangular cells allow us to better simulate air-earth interface on rough terrain. We applied the terrain correction procedure to reduce the topographic effect on the data, inverting it to create a flat-earth model. In our study, we see that topographic correction normalize numerical modeling error. Starting from this idea, the data was inverted considering the topography both before and after correcting for the topographic effect and the results are discussed.