

FULL WAVEFORM INVERTION OF CROSSHOLE RADAR DATAS

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Under the situation of have a few drilling in interested region, full-waveform inversion of cross-hole radar is an excellent technology to ascertain the anomalous bodies fine structures underground. The FWI approach we used is processing in time domain, including electromagnetic simulation using the FDTD method. The real filed crosshole radar data is related with the radiation patterns, antenna characteristics, topography, and so on. As a result the tomography quality of FWI of cross hole radar is heavily rely on the initial inversion model. We present using ray-tracing approach to provide a stable and accurate initial dielectric constant and conductivity model for FWI. In order to minimize the influence of topography, we conducted the forward modeling and FWI in curvilinear coordinate system. As research show, the initial model provided by ray-tracing approach can accelerate the iteration and convergence of FWI of invert dielectric constant and conductivity simultaneously. In addition, calculation in curvilinear coordinate system can decrease the influence of tomography and make the two FWI tomography more accurate compared to in cartesian coordinate system.