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Iterative methods for full waveform inversion

Full waveform inversion is a technique to solve the seismic imaging problem by matching forward and reverse numerical modeling of seismic wave propagation through a complex medium, updating the set of physical parameters that describe the details of this medium until an accurate image is achieved. We report on a partial stack method to speed convergence of the method, with numerical tests using both density and bulk modulus as the physical parameter under study. A waveform tracking technique to localize the numerical update increases the stability of the algorithm. The numerical PDE modeling uses an efficient finite difference solver for the elastic wave equation in two dimensions. This joint work with Gary Margrave and Vladimir Zubov at the University of Calgary.