

Optimal transport for seismic imaging

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In Full Waveform Inversion (FWI) seismic imaging is formulated as PDE constrained minimization where the miss-match between measured and computed signals plays an important role. The purpose is to find properties such as wave velocity and location of reflecting sub layers, which are represented by the coefficients in the PDE. We propose using optimal transport and the Wasserstein metric for this miss-match in order to reduce the risk of only finding local minima in the PDE constrained minimization. The optimal transport can be given by the gradient of the solution to a Monge–Ampère equation. Numerical examples comparing these new techniques with the classical L2 miss-match will be presented.