

Ray-Based Stochastic Inversion

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Seismic trace inversion techniques are aimed at determining subsurface rock- and pore fluid parameters from seismic reflections. An advantage of the class of stochastic trace inversion algorithms is that also uncertainties in these parameters can be computed. Hereby, a set of prior static reservoir models, derived from well-log data and seismic reflection picks, is iteratively updated to arrive at the desired set of posterior models.

However, in complex velocity media, the 1D modeling kernel of current stochastic trace inversion schemes is often not sufficiently accurate, since it does not properly take into account the spatial and temporal information contained in the actual propagation paths of waves that travel through the laterally varying subsurface. In order to extend the validity range of trace inversion methods to such complex media, our scheme therefore employs a 3D-elastic ray tracer as modeling kernel. Doing so, a close link is provided between Kirchhoff-Helmholtz pre-stack depth migration and Stochastic Inversion for reservoir properties.

In this talk we will discuss the novel method as well as results from synthetic data tests demonstrating some of its benefits.

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