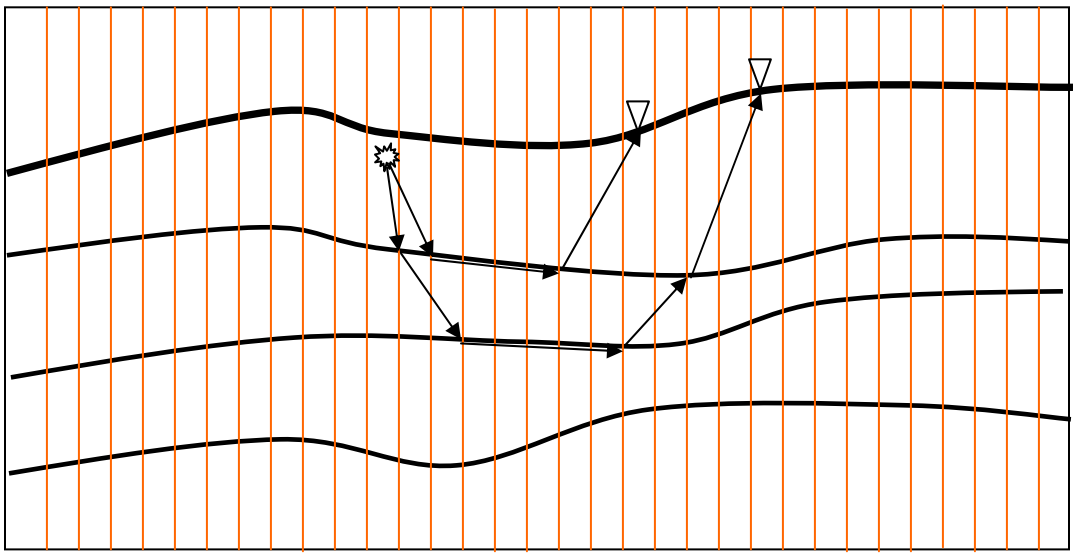
Project 5

2D Nonlinear Traveltime Tomography for Layered Models

Solve a first-arrival traveltime tomography problem for layered earth model with sharp layer interfaces. Model mesh is in the same fashion for GLI method or delay-time. But this approach solves a nonlinear inversion problem with model regularization applied.

Development: implement a 2D wavefront tracer for the mesh system, and implement inversion using the wavefront tracer. Test with synthetics and real data, compare with delay-time and grid-based traveltime tomography.



Model:	s(nx,nlayer), xmod(nx,nlayer), zmod(nx,nlayer), d(nx,nlayer)
Raypath storage:	ipath(nx*nlayer), backward tracking For a point ij0, ij1=ipath(ij0), previous point on the same ray. If ipath(ij)=0, pointing to source from ij.
Sources:	sx(ns), sz(ns)
Receivers:	rx(mr,ns), rz(mr,ns)

Source Codes Offered:
2D grid based wavefront tracer: fwd.f
Conjugate gradient inversion: tomo2d_inv.f
Other utility codes: read_geom.f, C wrapper

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