FWI with reflected waves for acoustic VTI media

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RWI algorithm

- migration with initial background model
- demigration using obtained image and initial model
- calculation of data misfit
- computation of gradient
- background model update

Wang et al. (2013)
Model with Gaussian anomaly

![Graph showing a Gaussian anomaly with Vp (m/s) scale.](image-url)
Initial model

![Initial model diagram](image)
Migration with initial model
Demigration

\[ L U_s(x, t; x_s) = \delta(x - x_s) \]
\[ L \delta U_s(x, t; x_s) = I(x) U_s(x, t; x_s) \]

- \( L \): wave operator (acoustic wave equation)
- \( U_s \): source wavefield
- \( I(x) \): migrated image
- \( \delta U_s \): demigrated source wavefield
Observed data (shot at 4.5 km)
Demigrated data for initial model
Data misfit

\[ F = \iiint d_{\text{cal}}(x_s, x_r, t) d_{\text{obs}}(x_s, x_r, t) ds dr dt \]
Migration with updated background velocity
Migration with initial model
Research plan

- extension to VTI model

- anisotropic parameter estimation