

Computational and Applied Math

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2D level set travel time inversion

Abstract:

Often, geophysicists are interested in recovering boundaries between different types of rocks. One example is precise delineation of boundaries of ore deposits in mineral exploration after the initial drilling and logging has been done, which is important for resource estimation and mine planning. We apply a level set inversion method to reconstruct boundaries of an ore body buried in host rocks from the first arrival travel time data. The problem is solved in a 2D cross-borehole tomography setting. The P wave velocities of the body and the host rocks are assumed to be known. We apply the method to synthetic and real data examples.