

SQP Method for Hyperbolic PDE-Constrained Optimization in Acoustic Full Waveform Inversion

Wednesday, August 14, 2024 9:00 AM (30 minutes)

This talk presents recent results on the SQP method for hyperbolic PDE-constrained optimization in acoustic full waveform inversion. The analysis of the SQP method is mainly challenging due to the involved hyperbolicity and second-order bilinear structure. This notorious character leads to undesired effects of regularity loss in the SQP iteration calling for a substantial extension of developed parabolic techniques. We propose and explore a novel strategy for the well-posedness and convergence analysis of the SQP method based on the use of a smooth-in-time initial condition, a tailored self-mapping operator, and a two-step estimation process along with Stampacchia's method. Our final theoretical result is the R-superlinear convergence of the SQP method.

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