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Temporal correlation of MFP with the presence of internal waves

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Internal wave is a dominant source of ocean uncertainties in shallow waters. The ability of passive source localization may be degraded due to mismatch between model predictions and measurements caused by the activities of internal waves. Using ocean environment measurements from an experiment, the effects of Garrett-Munk and solitary internal waves on the temporal correlation of matched-field processing (MFP) in shallow water for sources with different frequencies and different depths are numerically investigated. It is shown that the temporal correlation of MFP decreases as the amplitude of solitons or the average energy density of linear internal waves increased. For a source with lower frequency or located below the thermocline, the temporal correlation of MFP is less affected by internal waves, and the length of which is longer. Moreover, the effects of the range between solitons and source on the temporal correlation of MFP are relatively small.