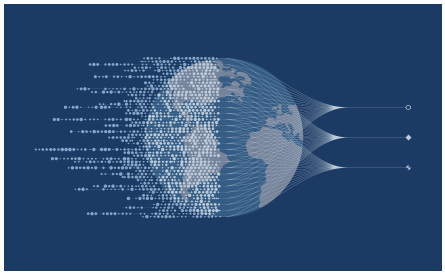

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uncertainty in regional-scale seismic moment tensors

Seismic moment tensors are a fundamental tool used to characterize events of interest to the nonproliferation community. Understanding and quantifying the uncertainty in moment tensor solutions are key to that characterization task. There are many sources of uncertainty confounding the accurate recovery of moment tensors, including imperfect knowledge of Earth structure between the source and receivers and low signal to noise ratios, as well as in the methods used, such as first motions, P- and/or S- amplitude picks, up to full waveform inversions. Earth models used in source inversions range from 1-D global to regional-scale models through 3-D regional tomographic models with varying degrees of fidelity and resolvability. We will present quantitative results of a synthetic study of the uncertainty in the recovery of seismic moment tensors by including sources of error from Earth models, noise, and the techniques used to solve for the moment tensors. The effects of realistic noise are evaluated by using noise models based on earthquakes at a regional scale. We also explore how inaccurate Earth models, as well as how differing assumptions and data used in moment tensor inversions, affect seismic source models.

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