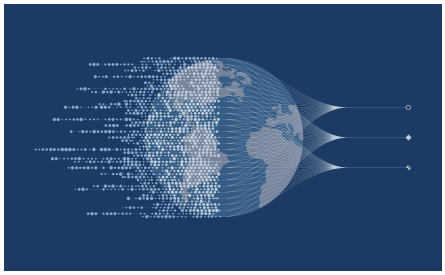

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Moment Tensor Inversion for Moderate to Strong Earthquakes in Albania and Surrounding Region Using Grond

This study employs Grond, a probabilistic earthquake source inversion framework, to analyse moderate to strong earthquakes (Mw 3.5–6.4) in Albania and the surrounding region. Using seismic data accessed via FDSN and a locally developed velocity model, moment tensor inversion is conducted to characterize complex regional seismicity. While the analysis primarily focuses on natural seismic events, the study emphasizes moment tensor inversion's utility in distinguishing between natural and human-made events when necessary. The modelling incorporates deviatoric and double-couple source types, utilizing radial, transverse, and vertical waveform components in the frequency range of 0.01–0.07 Hz. Forward modelling is based on precalculated Green's Functions (GFs) from Pyrocko GF Stores, created with the Fomosto tool and optimized for layered media using the QSEIS method. This approach enhances computational efficiency without compromising accuracy. To mitigate bias and quantify uncertainties, Grond integrates advanced bootstrapping techniques, including Bayesian and residual bootstrapping, ensuring robust source parameter estimation even with noise or modelling limitations. This research contributes to understanding tectonic processes in the region, showcasing Grond's effectiveness in seismic studies and its implications for seismic hazard assessment and identifying atypical seismic events.
Keywords: MTI, Grond, Bayesian, Green's Functions, Albania, Pyrocko

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