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# Seismic point and kinematic source solutions from rotational ground motion

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Though a standard procedure on a global scale, the retrieval of reliable seismic moment tensors on the regional/local scale is still hampered by several difficulties. Also, in the retrieval of kinematic source solutions, ambiguities and other problems still reduce the reliability of the results. So far, these source solutions are derived from only translational ground motions. Newly available possibilities to also portably measure rotational ground motions in a broad frequency range raised the question of how the resolution of the source solutions would benefit.
Here, we present the summarized results from several studies based on synthetic test cases considering six components of ground motion. We compare the results of waveform inversion from translational ground motion only versus including rotational ground motion. We focus on the number of stations, station distribution, source mechanism, and the influence of the underlying velocity model.
We show that the resolution of the source components benefits drastically from the inversion of six component ground motion data. Especially, the depth-dependent components and the centroid depth have high potential to be resolved much more reliable than from three component ground motion data only. Trade-offs and ambiguities can be reduced drastically as well, making the solution more reliable for further studies.