

Estimating stress field from seismic moment tensor data based on the flow rule in plasticity theory

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Stress field is a key factor controlling earthquake occurrence and crustal evolution. A method that slip data on many pre-existing faults reveals relative stress tensor in a region have been applied many regions. On the other hand difficulty of the method arises due to non-linear relation of slip vector to traction on a fault.

Here, we show stress field in a region with seismic activity can be estimated from sum of seismic moment tensors in the region based on classical equation in plasticity theory. Seismic activity is a phenomenon relaxing crustal stress and creates inelastic deformation in a medium due to faulting, which suggests the medium could behave as plastic body. The simple mathematical manipulation make easy to estimate stress field in a region and to develop inversion method in further studies.

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