

Foulger, G.R., Microearthquake Analysis Techniques For Geothermal Applications, EOS Trans. AGU, Fall Meet. Suppl., Abstract S32B-02 (invited), 2009.

S05: Observation And Analysis Of Natural And Induced Microearthquakes

Microearthquake Analysis Techniques For Geothermal Applications

The increased urgency to develop renewable energy resources, including geothermal power, and in particular Enhanced Geothermal Systems (EGS), has created a need for highly sophisticated microearthquake data processing techniques. EGS projects involve pumping fluid under high pressure into hot, low-permeability formations in order to create a hydrofracture network. A second well is then drilled through the new permeability network, and a working fluid, usually water, is circulated to mine out the heat. In order to guide drilling of the production well, highly accurate absolute and relative earthquake locations are required. Earthquake moment tensors can give information on the magnitude and mode of fracture, *e.g.*, shear or crack opening, and thus provide insight into the nature and usefulness of the permeability created. In this paper, I will review the best techniques currently available, along with discussion of accuracies presently achievable, new developments required for the near future, and recent case histories from real experiments.