



Spatial heterogeneities of deviatoric stress and pore-pressure in Kyushu, Japan, and their implication for seismic activity

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We investigated the spatial variation in stress fields and pore fluid pressures on Kyushu Island, southwestern Japan. High seismic activity is found not only along active faults in Kyushu Island (southwestern Japan) but also in the central area of the island where there are active volcanoes. We consider the focal mechanisms of the shallow earthquakes on Kyushu Island to determine the relative deviatoric stress field and pore fluid factor. Generally, the stress field corresponds to a strike slip regime in this area. A decline in the maximum principal compressional stress is found in the western part of the high seismicity area, in the middle of Kyushu Island; this may be caused by a thickening of the seismogenic zone, as estimated from D90 analysis. At thin seismogenic layer, strike slip faulting dominates and strain rate from GPS study is high. In the active fault zone, seismic activity along the fault is high, and the pore pressure within the zone is higher than the values observed elsewhere, suggesting a mechanism explained by the fault valve model of Sibson [1992]. The pore pressure in the high seismic area with scattered hypocenter distribution in the middle part is lower than that in the active fault zones.