

Transitional patterns of crustal stress field between Honshu arc and Ryukyu arc in Japan

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Deformation and stress state in active island arcs are important for understanding the dynamics. We analyzed crust stress state in the connective region between Honshu and Ryukyu arc to understand the transitional stress between with and without backarc opening of the arcs around southwestern Japan arc. In this study, we apply the multiple inverse method (Otsubo et al., 2008) into the focal mechanism solutions (best double couple components of regional moment tensors derived by F-net, NIED, Japan) in the area. The data were obtained from about ~400 shallow earthquakes (< 20 km) since January 1st, 1997 to December 31st, 2010. All local magnitudes were greater than 3.0. As a result, the multiple inverse method shows different stress province from one found by P-/T- axes. In perspective view, Shmax and Shmin directions rotate gradually from Honshu to Ryukyu. This result constrains patterns of the fan shaped stress trajectory between compressive Honshu arc and extensional Ryukyu arc, which is important issue to the understand geodynamics of subduction zone island arc. In addition, the multiple stress solutions and these stress ratio variations indicate locally heterogeneous stress states between Honshu arc and Ryukyu arc.

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Reference:

Otsubo, M., Yamaji, A. and Kubo, A. (2008) Determination of stresses from heterogeneous focal mechanism data: An adaptation of the multiple inverse method. *Tectonophysics*, 457, 150-160.

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