

# The relation between outer rise normal fault earthquakes and distribution of inter plate earthquakes

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NIED F-net section has calculated Moment tensor mechanism over Mj 3.5 using data of our broadband seismograph network(F-net) and unified source information of earthquakes, and has released the calculation result by our homepage. We found two high seismic activity outer rise regions from the distribution of earthquake mechanisms which we have calculated. These are the outer rise region of off coast of Sanriku and the outer rise region of east off Amami-Oshima.

The region of off coast of Sanriku and the region of off Amami-Oshima were high seismic activity of inter plate earthquakes. Near the region of off coast of Sanriku, there were a lot of large historical earthquakes. There are some studies of distribution of asperity in this region(ex. Yamanaka et al.,2004). Near the region of off Amami-Oshima, the M8.0 event in 1911 and Mj6.6 event with Tsunami in 1995 occurred.

In this study, we checked the outer rise earthquake depth. And we re-calculated moment tensor some of these events. As a result of this calculation, we got some moment tensors of shallow normal fault earthquakes near outer rise.

After the check and calculation, we assembled the distributions of outer rise earthquakes for the term October 1, 2003-February 1, 2005. In the outer rise region of off coast of Sanriku, we found a cluster of outer rise normal fault events around lat. 39.2N and long. 144.4E. And we also found other 2 group of outer rise normal fault events in the outer rise region. In the outer rise region of east off Amami-Oshima, we found a cluster of outer rise normal fault events around lat. 28.9N and long. 132.0E. And we also found distribution of single outer rise normal fault events in the outer rise region.

If the interplate areas of those subduction zone are unlocked, tensional bending stresses in the outer rise region will be enhanced (Lay et al. 1989). We expected that those cluster and distribution of outer rise normal fault earthquakes would concern with slip vectors distributions. We calculated the slip vectors from MT solutions of 15-60km depth interplate earthquakes.

We compared the distribution of outer rise normal fault events to the distribution of interplate earthquake slip vectors. As a result of the comparison, we found that the interplate areas extended along slip vectors from the outer rise normal fault events didn't have interplate earthquake. That suggests these interplate areas are unlocked.

In the interplate areas of off coast of Sanriku, we also compared these interplate areas to the asperity map (Yamanaka et al. 2004). We suggest that the interplate area connected to the cluster of outer rise normal fault events corresponds to the asperities of Iwate-oki earthquake in 1968 and in 1989.