

The character of the Focal mechanisms with Kagan angles in Japan area for the extended 2-D ETAS model

*Maita Eri¹, Jiancang Zhuang

1. SOKENDAI

The original epidemic-type aftershock sequence (ETAS) model which describes how each earthquake produces subsequent events considers only the locations, times, and magnitudes of each event. This time, we explore the possibility of combining the focal mechanisms into the model formulation to increase the estimation accuracy.

To find the suitable conditional intensity (time-varying seismicity rate) of the new form of the ETAS model, we use the F-net data from 1997 to 2017 and select focal mechanism of events with magnitudes > 2.0 . We use the Kagan angles (rotation angles) to transform each focal mechanism, a 3×3 matrix into a vector called a quaternion.

The data calculation leads to the model reconstruction to get the focal mechanism probability densities, under the assumption of a special symmetry, DC4 symmetry with the distribution of the Kagan angle. We also found that the rotation poles are uniformly distributed.

In the background events, the probability density of the focal mechanism or rotation angles, could be independent of any locations in the very small areas. We investigate the Japan area to find the character of .

Keywords: Focal mechanism, Kagan angle