

## Characteristic Small-earthquake Sequences near Miyakojima Island, Ryukyu Arc

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We found eight similar earthquakes of M5.1 regularly occurring from 1966 at about 50km in depth near the Miyakojima Island, the Ryukyu arc. The mean recurrence interval of the quakes was 5.89 years. Its standard deviation was only 0.73 years. Focal mechanism solutions and hypocenters suggested that those quakes occurred on the plate boundary between Eurasian plate and Philippine Sea plate. The accumulating strain energy presumably destroyed the same asperity enclosed by the creeping zone again and again. Also, we found three groups of similar earthquakes of M4 (coherences over 0.95), which occurred close to the M5 events. Now, we called those groups A, B, and C. Coherences between those groups were 0.70-0.90 and we could classify events into three groups significantly and objectively. Furthermore, those groups occurred again and again respectively; group A: 9 events, mean M4.4, mean interval 2.25 years, standard deviation 0.69 years; group B: 8 events, mean M4.2, mean interval 2.38 years, standard deviation 0.31 years; group C: 6 events, mean M4.0, mean interval 1.81 years, standard deviation 0.14 years. In the case of group A and B, we could not say that they had individual characteristic recurrence interval or that they influenced each other. On the other hand, two events of group C, occurred within one week after the M5 quakes, showing that the M5 events caused the group C events whose asperity had enough strain energy. This idea was also supported by the distance of 1-2 km between the group C and the group of M5 events.

There were four characteristic earthquake sequences in a narrow area near the Miyakojima Island. There would be a lot of seamounts on Philippine Sea plate, which could be asperities. Moreover, no earthquake larger than M7 has been observed on the subduction zone around the Ryukyu Islands, which could change the recurrence intervals. Therefore, there would be a lot of characteristic earthquake sequences in other areas of the Ryukyu district.

We expected that the next M5 earthquake would occur from May 2012 to January 2015 with 95% probability, using the BPT distribution model. Moreover, the M5 event could accompany the M4 quake that would destroy the asperity of group C within a few days.

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