

SSS026-10

Room:302

Time:May 27 12:15-12:30

Hypocenter relocation of M7-class earthquakes and comparison with the interplate quasi-static slip in the Hyuga-nada

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In the Hyuga-nada region, the Philippine Sea Plate subducts northwestward beneath the Eurasian Plate an approximate rate of 5 ~ 7 cm/year, and M7-class interplate earthquakes have repeatedly occurred at decade years interval. We relocate the hypocenters of the main shock and aftershocks for the major interplate earthquakes which occurred in 1931 (Mjma7.1), 1941 (Mjma7.2), 1961 (Mjma7.0), and 1970 (Mjma6.7), and compare them with the quasi-static slip rate estimated by the analysis of small repeating earthquakes.

We used the smoked-paper records and the Seismological Bulletin of the Japan Meteorological Agency (JMA). All the hypocenters were relocated using S-P time instead of P or S arrival time for reducing the error caused by inaccuracies of the clock. We assumed that the hypocenters located on the plate boundary from *Uehira et al.* (2010). Theoretical S-P times were calculated by 3D ray trace with 3D velocity structure model.

The hypocenter relocation showed that the hypocenter of 1961 event locates at about 20km west of the hypocenter by JMA. The relocated hypocenter coincides with the area in which the interplate quasi-static slip rate is small [*Yamashita et al.*, 2010]. This implies that the area corresponds to an asperity on the plate boundary, which is consistent with the results of stress tensor analysis by *Uehira* (2007).

Acknowledgement

We thank Dr. Yakiwara (NOEV, Kagoshima University) who provided 3D ray trace program. We also thank the members of the Fukuoka District Meteorological Observatory, Kagoshima, Miyazaki, Kumamoto, Oita, Saga, Shimonoseki Local Meteorological Observatory, and Nagasaki Marine Observatory for collecting the smoked-paper records of Hyuga-nada earthquakes.

Keywords: Hyuga-nada earthquake, Interplate quasi-static slip, Hypocenter relocation