# Promotion of slow earthquakes by a subducting seamount chain of Kyushu Palau Ridge in Hyuga-Nada

*Rie Nakata[1], Masataka Kinoshita[1], Yoshitaka Hashimoto[3], Yohei Hamada[2], Mudasar Saqab [4], Yanxue Ma[1], Kimihiro Mochizuki[1], Yasuyuki Nakamura[2], Ryuta Arai[2], Seiichi Miura[2], Gou Fujie[2], Paumard Victorian[5]

1. Unviersity of Tokyo, 2. JAMSTEC, 3. Kochi University, 4. Norwegian Geotechnical Institute, 5. University of Western Australia

Subducting seamounts create spatially variable stress and induce substantial deformation into the upper plate. By combining with frictional properties, the plate boundary faults will exhibit unique and complex slip behaviors much different from those where the oceanic plate is smooth. The Hyuga-Nada region offshore Kyushu, Japan, is an outstanding locale to study the effect. The region is located at the boundary between the Nankai Trough and the Ryukyu Trench separated by an obliquely subducting seamount chain of the Kyushu Palau Ridge (KPR). The rough plate-interface topography due to KPR clearly affects the seismicity of the region. The spatiotemporal recurrent shallow slow earthquakes of non-volcanic tremors and very low frequency earthquakes (VLFEs) are well correlated to a currently subducting seamount inferred from the geomagnetic anomaly and seismic sections. The top of the oceanic crust shows high- and low-wavenumber features in topography. The basal decollement marked by a strong reflection with negative polarity is complex but not always parallel to the basement rough topography. The materials between the decollement and the plate interface are either underthrusted sediments or erosional remanent of the overriding plate with substantially varying thickness and internal structures. The tremors and VLFEs do not occur immediately above the seamount, but occur around the subducting seamount at apparently two distinct locations. At the leading side of the subducting seamount, the tremor-VLFE distribution coincide with the seafloor uplift and shallow fractured zones which suggest the area is under significant compression. The other VLFE-tremor rich area is on the east side of the seamount. Accretionary prisms east of the seamount show structures typical in the Nankai Trough and suggesting the area is currently under compressive stress regime due to tectonics. KPR previously obliquely swept this area from east to its current position suggesting a deeper portion may still be affected by the previous disruption. The distinct geomorphological and stress regimes at these two locations may be the reason for the distinct north-south and east-west migration patterns of the past tremors. The tremors may need some extra energy (e.g., a distant earthquake) to transition between the regimes.

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