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日向灘における地震波速度構造とプレート間カップリングの関係
The relationship between velocity structure and the seismic coupling in the Hyuga-nada region, southwest Japan

植平 賢司[1*], 八木原 寛[2], 山田 知朗[3], 馬越 孝道[4], 中尾 茂[2], 小林 励司[2], 後藤 和彦[2], 宮町 宏樹[2], 望月 公廣[3], 中東 和夫[3], 篠原 雅尚[3], 金沢 敏彦[3], 日野 亮太[5], 合田 政次[6], 清水 洋[1]
Kenji Uehira[1*], Hiroshi Yakiwara[2], Tomoaki Yamada[3], Kodo Umakoshi[4], Shigeru Nakao[2], Reiji Kobayashi[2], Kazuhiko Goto[2], Hiroki Miyamachi[2], Kimihiro Mochizuki[3], Kazuo Nakahigashi[3], Masanao Shinohara[3], Toshihiko Kanazawa[3], Ryota Hino[5], Masaji Goda[6], Hiroshi Shimizu[1]

[1] 九大・理院・地震火山センター, [2] 鹿児島大・理工院, [3] 東大・地震研, [4] 長崎大・環境, [5] 東北大・理院・地震火山セ, [6] 長崎大・水産
[1]SEVO, Kyushu Univ., [2]Sci. and Eng., Kagoshima Univ., [3]ERI, Univ, of Tokyo., [4]Env., Nagasaki Univ., [5]AOB, Tohoku Univ,, [6]Fish, Nagasaki Univ.

In Hyuga-nada region, the Philippine Sea (PHS) plate is subducting beneath the Eurasian (EU) plate (the southwest Japan arc) along the Nankai trough at a rate of about 5 cm per year. In this region, microearthquake activity is very high. Big earthquakes (M7 class) have occurred at intervals of about dozens of years, and so plate coupling varies dozens of kilometers specially. It is important to understand seismic activity, stress field, and structure in such region in order to understand seismic cycle. According to the previous study of Uehira et al. (2007), there is a good correlation between the slip distribution at large earthquakes and the angle between maximum principal axis and the plate boundary in northern part of Hyuga-nada region. We performed extraordinary seismic observations for 75 days from April to July 2006, for 73 days from April to July 2008, and for 77 days from April to July 2009. About 25 pop-up type ocean-bottom seismometers were deployed above hypocentral region in Hyuga-nada using Nagasaki-maru. And three data loggers were deployed on land in order to compensate a regular seismic network. We used these data and permanent stations for this analysis. In order to obtain precise hypocenter distribution, focal mechanisms, and a 3D seismic velocity structure around the Hyuga-nada region, we used Double-Difference (DD) Tomography method developed by Zhang and Thurber (2003). In northern part of Hyuga-nada, Vp/Vs ratio is high along the upper part of PHS slab, and this layer is interpreted as the subducting oceanic crust. On the other hand, Vp/Vs ratio is about 1.73 in southern part of Hyuga-nada, and this is interpreted as the subducted Kyushu-Palau Ridge, old island arc, which is made by granitic rock. More over, there is a difference of Poisson's ratio at mantle wedge. This value is high ($>$ 0.3) in northern part of Hyuga-nada. The high Poisson's mantle wedge is suggesting that the zone probably corresponds to a serpentinized wedge mantle. This results is consistent with weak plate coupling. In southern part of Hyuga-nada, Poisson's ratio at mantle wedge is about 0.25. Uehira et al. (2007) was estimated that plate coupling is strong in southern part of Hyuga-nada, so, this result is consistent with this estimation.