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Basement structure based on gravity anomaly in the northwestern Noto peninsula

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The northern Noto Peninsula is divided into four geological block structures from tectonic geomorphological perspectives (Ota and Hirakawa, 1979). The 2007 Noto Hanto earthquake caused the coseismic uplift in the Kuwatsuka block and active faults on the seafloor was played a major role for the formation of the block structures (Hiramatsu et al., 2008).

We compiled the data measured and published previously (Gravity Database of Southwest Japan, 2001; Geological survey of Japan, 2004; Geographical survey institute of Japan, 2006; The Gravity Research Group in Southwest Japan, 2001; Komazawa and Okuma, 2010; Hokuriku electric power Co. Ltd., undisclosed) and calculated Bouguer anomaly in the northwestern Noto Peninsula. Based on this Bouguer anomaly, we analyzed subsurface density structures along eleven northeastern-southwestern profiles and seventeen northwestern-southeastern profiles using the two dimensional Talwani's method (Talwani et al., 1959).

The boundary between the Kuwatsuka block and the Saruyama block corresponds to a transition zone where the basement depth becomes deeper toward north. The boundary between the Saruyama block and the Hachibuse block also corresponds to another transition zone where the basement depth becomes deeper toward east. In addition, boundary between active fault segments, Monzenoki segment and Saruyamaoki segment, on the seafloor reported by Inoue and Okamura (2009) corresponds to a transition zone of basement depth. The distribution of the basement depth obtained by the analysis of Bouguer anomaly, thus, suggests that the block movement in the northwestern Noto peninsula relates to the movement of active faults on the seafloor.