Bouguer Anomalies and Geological Structure around Ohchigata Fault Zone

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In the Noto peninsula, old granitic basement, which are composed mainly of Hida gneiss, is covered by the Neogene sediments and volcanics. Because of the large density contrast between them, detailed Bouguer anomalies will give important information about the depth variation of the basement. Comparing geologic block structures of the Sekido-Hodatsu mountain region with gravity anomalies, we will discuss geologic activity of the Ochigata fault zone.

The Sekidoh-hohdatsu mountain region shows different geologic characteristics area by area. Katagawa et al. (2002) demonstrated that this area consists of several blocks, and differential upheaval of each block progressed in the Quaternary period. The blocks are discriminated as Nanao, Kashima, Shio and Hohdatsusan blocks, from north to south. The EW fault which divide these blocks are Sano-Iori fault, Korosa tectonic line, Iiyama-Yabuta tectonic line and Hodatsusan-Hokuen fault, from north to south.

For dense gravity survey has already been done around the Ochi plain, we increased gravity data over the middle and northern part of the Noto peninsula. Compiling new and existing gravity dataset, we produced a detailed gravity anomaly maps. To eliminate gravitational effect from deeper structures, such as undulation of Moho, a long-wavelength component has been subtracted from Bouguer anomaly distribution (Kono et al., 2006). Zones of horizontally steep gradient of gravity anomalies (Kono and Furuse, 1989; Suto et al., 2004) presumably give important information about the existence of hidden faults. Presences of the steep horizontal gradient zones infer step-like structures of basements.

Characteristic features of the gravity anomalies over the survey region are as follows: Large Horizontal Gradient Zones (LHGZ) of gravity anomalies lay in northwestern, southern and southeastern edges of the Ochi plain. The southeastern LHGZ shows good correspondence with the plain-hill topographic boundaries. At the northern part, however, the gradient is still large but shows poorer continuity. LHGZ at the southern edge shows EW trend, and this interrupt the southeastern LHGZ in the Ochi plain. Remarkable LHGZ is not found in the northern part of the Noto peninsula.

These LHGZs show good correspondence with active faults or block structures around the Sekido-Hodatsu mountain region (Katagawa et al., 2002). The LHGZ at the southern edge of the Ohchi plain seems to correspond to the Hodatsusan-Hokuen fault (Katagawa et al., 2002). The LHGZ in southeastern part of the Ochi plain corresponds to the Ohchigata fault zone. This closely lies along the boundary between plain and mountains, and seems to be blocked by the southern LHGZ. The Iiyama-Yabuta tectonic line divides the Sekido mountain region into two parts. Northern part of this region has relatively high gravity anomalies, and southern part has relatively low. The southern part of the southeastern LHGZ shows offset with the topographic boundary, i.e., the LHGZ lies in 2 or 3 km inside the mountain region (Katagawa et al., 2002; Suto et al., 2004).

We conclude that the LHGZs and block structures around the Sekido-Hodatsu mountain region show considerable agreement. This presumably shows close relationship between the Quaternary activity of the Ochigata fault zone and the block structures around the Sekido-Hohdatsu mountain region.