

Seismic reflection survey crossing the high Bouguer anomaly at Yatabe, Ibaraki Prefecture

Kazuo Yamaguchi[1], Naomi Kano[2], Takanobu Yokokura[2], Toshiyuki Yokota[3], Jun Matsushima[4], Toshiki Ohtaki[1], Shinobu Ito[5], Akiko Tanaka[6]

[1] AIST, [2] Institute of Geoscience, GSJ, AIST, [3] Geophysics Dept., GSJ, [4] GSJ, [5] Geological Survey of Japan, [6] Geological Survey of Japan/AIST

A seismic reflection survey was conducted in the Yatabe area, southern Ibaraki Prefecture, central Japan. This is an northward extension of a seismic survey in the Kukizaki area reported by Yamaguchi et al.(2001). Alluvial plains and diluvial uplands prevail in the Kukizaki-Yatabe area and a high Bouguer anomaly is notable at Yatabe. Komazawa and Hasegawa(1988) assumed that a high density and low magnetized rock body causes the anomaly rather than simple upheaval of the basement dose. But the subsurface is not well known in this area.

The Yatabe seismic data was preliminarily processed to obtain a brute stack section. The processing menu includes edit, vertical stack, geometry input, bandpass filter, gain recovery, trace balance, constant velocity NMO and CMP stack. Because either static corrections or velocity analysis have not been applied yet, the followings are subject to change. The basement top shallows northward at the south edge of the seismic section. Near the high Bouguer anomaly, the depth of the basement top is 0.5 or 0.6 second in two way time and the top is obviously shallower than the southern and northern parts of the basement. The shallow part is almost flat and about 3km wide.

The seismic section revealed that the basement shallows under the high Bouguer anomaly. By the meeting, both the Kukizaki and Yatabe seismic data will be merged and processed together to get one seismic section.

Parameters of the two seismic surveys are as follows. Source:Mini-Vib T15000(IVI), sweep length:16s, sweep frequency:10-100Hz, sweep number per shot point:4-9, shot point interval:10m, receiver:UM2(MarkProducts), frequency:10Hz, grouping:12elements/10m, receiver point interval:10m, spread:split spread(south 100ch & north 44ch), offset(south 5m-995m & north 5m-435m), recording system:DAS1(OyoGeospace), sampling interval:2ms, number of channel:144, total number of shot points:1808, total number of receiver points:1800, total number of CMPs:3437, length of CMP line:17.2km

Reference

Komazawa, M. and Hasegawa, I.(1988) The graben structure by the gravimetric basement in the Kanto district, central Japan, Mem. Geol. Soc.Japan,31, 57-74.

Yamaguchi, K. et al.(2001) Seismic reflection survey at the southwest Ibaraki Prefecture -Basement structure near the inferred Median Tectonic Line-, Japan Earth and Planetary Science Joint Meeting, Sz-P012.