

CMP-SPAC and SPAC microtremor array surveys around Tegano active fault, Gifu, Japan

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We conducted microtremor array measurements for subsurface velocity structure around a reverse active fault, Tegano Active fault, Gifu prefecture, central Japan. We set about 5 km long NW-SE trending measurement line from the GIFH28 KiK-net station, where the bedrock depth is GL -360m, to the area where granite outcrop is seen.

Two types of microtremor observations were made on Dec. 2019. One is regular triangle array and the other is linear array. For the regular triangle array, we deployed eight 3-component velocimeters (Tokyo Sokushin Corp. SE-321, natural period 10 seconds), and for the linear array observation, we used 40 geological McSeis-AT systems (hereinafter Atom).

Regular triangle array observations were conducted at three locations: near GIFH28 (for one night), near the granite outcrop (MinoNW: for one hour), and at an intermediate point (MinoS: for one hour). The maximum array radius is 500 m for GIFH28, 375 m for MinoS, and 250 m for MinoNW. The SPAC method is used for analysis.

As for the linear array observation, we used a vertical motion velocimeter Sunful PS-2B with a natural frequency of 2 Hz (Suzuki et al., 2019). The seismometers were installed at intervals of about 50 m, and three sets of observations were made with a deployment of about 2 km and an overlap of 0.5 km, so the total line length was about 5 km . The measurement was performed at a sampling frequency of 250 Hz and about 40 minutes each time. Data are analyzed with a microtremor tomography CMP-SPAC method (Hayashi et al., 2018). The analysis section length is 65.536 seconds, and the bin size of CMP is 250m. The observed phase velocities around GIFH28 showed good agreement with the theoretical phase velocities based on PS logging results. Furthermore, it was found that the phase velocity tended to increase from GIFH28 to the northwest, and especially at the Chuo rail way line, about 3 km NW from GIFH28) the phase velocity gets quite large.

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Keywords: microtremor array survey, Linear array, Tegano fault

