

Temporary seismic observations and the characteristics of earthquake ground motions along a north-south line in the Yatsushiro plain

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The Yatsushiro Plain is an alluvial lowland located in the central and southern part of Kumamoto prefecture, and has an area of about 10 km east to west and about 25 km north to south. The northern part of the Yatsushiro plain is the Uto Peninsula, eastern and southern side are the Kyushu Mountains across the Hinagu fault zone. The Yatsushiro plain is consist of fans and tidal flats formed by Kumagawa, Sunakawa and Hikawa, and the thick soft-soil sediments deposite on the bedrock (e.g. Higashi *et al.*, 2014). The reclaimed land after the early modern period occupies about two-thirds of the plain.

The Headquarters for Earthquake Research Promotion supposes that strong ground motions, the Japanese seismic intensity scale of 7 will be observed in the wide range of the Yatsushiro plain for future earthquakes along the Futagawa-Hinagu fault system. In order to evaluate the ground motion characteristics in the Yatsushiro Plain, we are observing earthquakes along a north-south line in the Yatsushiro Plain, a section of 20km from the Uto Peninsula (northern end of the Yatsushiro plain) to the Kumagawa river (southern end). We installed 12 temporary seismic stations at intervals of about 2.0km along a north-south line in the Yatsushiro Plain, and 2 stations at rock site on May 9, 2017. The sensors used in this observation are accelerometesr of JEP-6A3 by Mitutoyo Corp. and the data loggers are LS8800 by Hakusan Corp. with the continuous recording.

We evaluated site amplifications for temporary seismic sites to reference sites, using the observed seismic wave data. Reference site is temporary rock site in the western foot of the Kyushu mountainous. We calculated the Fourier spectra for a time-window of 20.48 seconds after initial S-wave arrival. The spectral ratios at the sites in the Yatsushiro plain have a factor of dominantly larger than 1 in the low frequency 0.3-2 Hz. It corresponds to the fact that the entire Yatsushiro plain is covered with thick soft-soil sediments. On the other hand, at sites close to the northern or southern end of the survey line, the peak of the frequency is 1-2 Hz, and the amplification factor is smaller. We estimate that the changes corresponding to a decrease in thickness of soft-soil sediments are observed.

We will performe array microtremors observations at the temporary sites, and discuss the ground motion characteristics at the Yatsushiro Plain using the site amplifications by seismic observation data and S-wave velocity structures estimated by array microtremor observation data.

Keywords: Ground motion characteristics, Temporary seismic observation, North-south line in the Yatsushiro Plain