

Microtremor Array Exploration in the Syiah Kuala University, Banda Aceh, Indonesia

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We deployed microtremor array survey at Syiah Kuala University in Banda Aceh, Indonesia to clarify a seismic amplification by subsurface S-wave structure. Banda Aceh, located at northern end of Sumatra island, was seriously damaged by the tsunami caused by the 2004 Sumatra earthquake. At the tsunami evacuation, we first have to consider the safe route that does not corrupted, damaged and flooded. Therefore, we plan to understand the seismic amplification distribution as fundamental material. Our results will be available to make a future plan to reconstruction/renovate architectures.

We visited to Banda Aceh at January, 2019, and carried out microtremor exploration using with linear array and triangle array at 17 sites. We used are three 5 Hz geophones and one 1 kHz sampling GPS synchronised data logger for survey. In the case of triangle array, we always used 1.7 m side length. This side length is corresponding to 1.0 m array radius. In the other case, that is linear array, distances of each sensors (A, B, and C) are, A-B:1.7 m, B-C:2.7 m, and A-C:4.4 m. We Assumed these lengths are the array radius for each exploration, and applied SPAC method (*c.f.* Aki 1957). We used a tool, as known as BIDO2.0 (Cho, 2010) to analyze recorded waveforms and estimate dispersion curves.

By using obtained dispersion curves, we determined 3 averaged S wave velocities and roughly velocity structure. Roughly velocity structure was estimated by simple conversion method by using 1/2 wavelength law with linear array's dispersion curves. And three Averaged S-wave velocities AVS10, AVS20 and AVS30 were estimated from the Rayleigh wave phase velocities corresponding to the wave length of 13 m, 25 m and 40 m, respectively. By a preliminary analysis, we obtained result that a thicker low S-wave velocity layer exists along the river and the coastline. This result implies that plain part of Banda Aceh was developed on the old delta made by river and sea. This situation of subsurface structure will be strongly affect to the seismic amplification.

We will discuss in detail at the presentation.

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