Experimental observation toward the realization of low-cost and high-density strong-motion observation network

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After the 1995 Kobe earthquake, high-density strong-motion observation network without parallel in the world has been improved in Japan. For example, the National Research Institute for Earth Science and Disaster Resilience (NIED) built K-NET (Kyoshin network), which consists of more than 1,000 seismic observation stations distributed every 20 km uniformly covering Japan. In Kansai area, together with the network, The Committee of Earthquake Observation and Research in the Kansai Area (CEORKA) has built one's own strong-motion observation network since 1994. However, under the existing observation density, there is a limit to comprehend the seismic ground motion. To solve the problem, there is a method of increasing the number of seismic observation station furthermore. However, the method requires a huge amount of money.
We developed a prototype of a low-cost ITK sensor, which is composed of Raspberry Pi (small single-board computer) and ADXL355 (MEMS acceleration sensor), corresponded to the IT strong-motion seismometer and began experimental observation using the sensor for evaluating the performance as a strong-motion seismometer, in parallel with the experimental operation of the low-cost seismometer network using VPS (Virtual Private Server) and VPN (Virtual Private Network) (Ito et al. (2019)). We will continue the experimental observation and will conduct further examination toward the realization of low-cost and high-density strong-motion observation network.

Keywords: Strong-motion observation, Strong-motion seismometer