

## Encouragement of High Frequency Observational Seismology

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Available frequency ranges for the ordinary observational seismology is limited up to about 30Hz. This limitation is controlled by seismometer's frequency response and/or sampling frequency of data logging system. Why observation frequency is limited up to 30Hz? Interesting phenomenon does not exist above this frequency?

Recently, high speed sampling data logging systems with high dynamic range were developed. In this study, we could use the two high speed sampling data logging systems, which developed by Scimorex Inc. These systems can record continuous 10kHz data sampling with 24 bits resolution, which controlled by GPS timing. We used these data logging systems to observed seismic motions with 1 Hz, 2 Hz eigenfrequency moving coiled velocity seismometers, and over-dumped acceleration seismometer, at Tono region Gifu prefecture, Japan from Dec. 2011. Data amount is not so big, only 3GB/day; for 4 channels with 10kHz sampling.

Fortunately, we could observe the earthquake, which occurred below the Tono region with  $M_{JMA} = 5.1$  (2011/12/14 13:01) and its after shocks. In this study, we have verified the performance of SC-AD10K, and we concluded SC-AD10K has good for observation. Additionally, we will show some interesting observed phenomena, and introduce high frequency observational seismology, and its applicational plan, for example, detailed velocity structure estimation and its velocities monitoring.

We believe more interesting phenomena exist at these frequency ranges. The reasons that past studies did not done at these frequencies are that data logging systems was still developing and observational seismologists feared the amount of data given by high speed data sampling.

Keywords: High speed data logging system, High frequency seismogram, Detailed velocity structure, Seismic wave velocity monitoring