

The observation and analysis of ACROSS signals by seismic networks (Part II) - Determination of the transfer function -

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In previous study, we pointed out that the seismic ACROSS signal broadcasted from Tono mine could be clearly observed at JMA and Hi-net seismic stations with the epicentral distance up to 100km. The transfer functions between the ACROSS source and JMA and Hi-net stations were obtained using FM signals. In this presentation, we will show the interesting features such as the detection of small time-variation of the transfer function obtained by the FM signal (modulation period: 20sec, modulation range: 15.47 - 20.57Hz), the broadcasting of which had started on 2003/04/15 and is now continuing for data accumulation for the analysis of temporal variation.

Acquired observation data are stacked for 10-days long with a stacking interval of 100 sec. Because the rotating direction of eccentric mass is switched every 1-hour, we have a set of radial and transverse excitations towards any of stations by summing up the source signals of normal and reverse rotations with appropriate phase shift. Then we can get a set of 6 transfer functions; three responses; radial, transverse and vertical for two excitations; radial and transverse. The epicentral distance of stations used in this analysis is limited less than 50 km to avoid the time domain aliasing due to the modulation period of 20 s. Some interesting features are obtained from our analysis. (1) The amplitude of transfer function for Hz (excitation by radial force and vertical response at receiver site) and Htz (excitation by transverse force and vertical response) is almost the same. This means that the transfer function includes the information on the lateral heterogeneity through the various types of wave scattering of waves. (2) The time variation of the transfer function is observed although the change is quite small. We will discuss the possible origin of this time variation.