

Correction of atmospheric effect on gravity at seismic frequencies with a local barometric observation network

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Atmosphere has a significant effect on precise gravity observation through Newtonian attraction by its mass and deformation of land by loading. This effect is difficult to correct for, because it is dependent on 2-dimensional (or even 3-dimensional) distribution of atmospheric pressure around gravity stations. In particular, little effort has been made on the reduction of atmospheric effect in seismic bands, partly because of limitation in temporal and spatial resolution of global atmospheric models.

We have installed barometer stations around the Matsushiro superconducting gravimeter station to establish a local barometric observation network, so that we can better model the atmospheric effects on gravity at higher frequencies. In this study, a trial is made to reduce barometric noise in gravity using the data from this network, with special attention to the long period seismic bands where the gravest modes of earth's free oscillations exist.