

Accuracy of a laser seismometer evaluated from parallel observation with a superconducting gravimeter and a broadband seismometer

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Broadband seismometers and superconducting gravimeters are widely used as vertical motion sensors to observe long-period seismic waves such as Earth's free oscillations. These sensors used in a seismic observation network are required to be well calibrated and have uniform properties in amplitude and phase.

Broadband seismometers are usually calibrated by manufacturers or users in the factory, and the calibration factors are used in the observation. Superconducting gravimeters are calibrated after installation using an absolute gravimeter. On the other hand, the laser seismometer can be calibrated referred to the laser wavelength of itself.

We evaluated accuracy of the self-calibration in the laser seismometer by comparing a broadband seismometer, a superconducting gravimeter, and the laser seismometer at the same site, Kamioka mine. The laser seismometer enables in-situ calibration of broadband seismometers in the seismic network, and contributes to improvement in accuracy of the seismic observation.