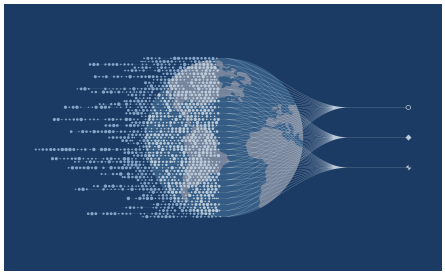

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Calibration of Weak Motion Seismometers using Strong Motion Accelerometers as Reference

Traceable calibration of broadband weak-motion seismometers is an ongoing challenge. In a specialized laboratory, verification of the response up to the upper corner frequency is achievable, but at a typical lower corner period accuracy is limited by parasitic tilts. Since such primary calibrations are not practical in the field, it has been proposed instead to use lab-calibrated reference seismometers in field calibrations, but then accuracy is limited by at high frequency by the stiffness of the coupling between the sensors, and other factors. There is, furthermore, the question of the stability of the response of the reference sensor with time and temperature.

We propose strong-motion accelerometers as an alternative reference. These instruments have several attractive characteristics. First, the response is flat to acceleration down to zero frequency. Second, some models have a both a clip level high enough to measure the acceleration due to gravity, and a noise floor low enough to resolve ocean microseisms. These properties mean absolute calibration of the reference can be performed on-site, and relative calibration can be done in a side-by-side test. We demonstrate such a calibration and show how this could be part of routine traceable field calibration of IMS instrumentation.

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