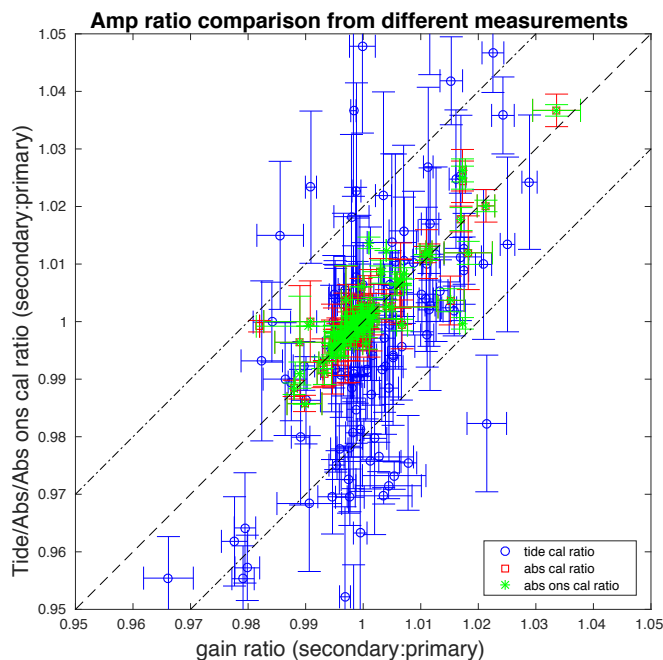


Revision of metadata sensitivities at IRIS/IDA stations

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ABSTRACT. In seismic data, the published metadata are usually used to record instrument responses and their accuracies, which includes zero-frequency sensitivity for seismometer, data logger and other frequency-dependent elements. In this work, we focused on the variations of the seismometer sensitivity with time at IRIS/IDA GSN seismic stations with the aim of improving the metadata accuracy for the history of the network. There are several ways to measure the accuracy of seismometer sensitivity for the seismic stations in service. An effective practice recently adopted by the GSN is to collocate a reference seismometer in proximity to permanently installed sensors to verify the in situ sensors' calibration. For those stations with a secondary seismometer, the IRIS MUSTANG system introduced a transfer function metric to reflect two sensors' gain ratios in the microseism frequency band, 4-30 seconds. In addition, a simulation approach based on measurements of the M2 tidal line (44,712 seconds period) has proven effective. In this work, we compare and analyze the results from three different sensitivity estimation methods, and conclude that the collocated-sensor method is the most stable and reliable with the minimum uncertainties for the entire network life. However, for calibration epochs lacking both the collocated sensor and secondary seismometer, we rely on the analysis results from the tidal method. For IRIS/IDA data since 1992, we obtained over 1100 revised seismometer sensitivity values spanning all epochs.



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