

## Imaging the Kanto Basin bedrock with seismic noise and earthquake autocorrelation functions

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Sedimentary basins can strongly amplify seismic waves from earthquakes. To better predict strong ground motions, a good understanding of both the sediment thickness and the internal basin structure is required. In this study, we map the deep and complex bedrock shape of the Kanto Basin, Japan, using ambient seismic noise and earthquake autocorrelation functions (ACFs). Noise ACFs are computed using one month of continuous data recorded by the vertical component of 287 MeSO-net stations located in the greater Tokyo area. Earthquake ACFs are obtained from the vertical records at MeSO-net stations of 50 Mw 6+ teleseismic earthquakes, which occurred between May 2017 and April 2020. Noise and earthquake ACFs both contain P-wave reflections from the sediment-to-bedrock interface that yield a consistent bedrock depth. The bedrock depths obtained with both methods also agree well with that from existing 3-D velocity models. Noise and earthquake ACFs open new opportunities to refine images of complex sedimentary structures and better mitigate the associated seismic risk.