

## Evaluation of Site Response in the Los Angeles Basin from Spectral Ratio Analysis of Microtremor Data from a High Density Temporary Broadband Deployment

Sedimentary basins, such as the Los Angeles basin, can significantly amplify seismic ground motion and increase its duration, considerably increasing the potential for damage and loss in urban areas. Most site response studies in the Los Angeles basin use strong ground motion data and thus require local earthquakes. Another approach to investigate site response is to apply techniques and methods developed for microtremor recordings. We will present the results of our investigation of site response within the Los Angeles Basin through the application of the microtremor Horizontal-to-Vertical (H/V) spectral ratio method using the Geopsy software. This method was applied to 3-component broadband waveforms from the Los Angeles Syncline Seismic Interferometry Experiment (LASSIE). LASSIE is a collaborative, dense array of 73 broadband seismometers that were active for a two-month period from October until November 2014, transecting the Los Angeles basin from Long Beach to La Puente. The data from this array enabled us to make measurements of small-scale lateral variations in the peak frequency, amplitude, and directional dependency of the H/V spectral ratio for a station separation of ~1 km across this highly populated sedimentary basin. Data analysis and interpretation were conducted in accordance with the Site Effects Assessment Using Ambient Excitations (SESAME) guidelines. The frequency and amplitude of peaks in microtremor spectral ratios have been shown to be related to resonance frequency and site amplification. Our results show long period spectral peaks at the basin center at periods of 6 – 9.5 s and additional peaks in the spectral ratio curves at much shorter periods for sites at the basin edge. Long period spectral peak amplitudes range from 2 – 5.5, with the highest values measured for the greater Long Beach area. We observe directional dependency in the frequency and amplitude of the long period spectral peaks in proximity to the basin edge, which appears to correlate with the strike of the basin structure. We will show profiles of the H/V amplitudes and peak frequencies across the LA Basin and interpret our results in the context of site response results from other studies, as well as models of shallow and deeper basin structure, such as the SCEC Unified Community Velocity Model (UVCN).