



Long period seismic noise modulated by atmospheric tides

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The amplitudes of long-period (LP) seismic noise often exhibit a daily modulation, which is particularly visible on data recorded by temporary stations and horizontal components. These daily variations of the LP noise have been associated with temperature fluctuations. Temperature has been suggested to affect the noise recorded by seismometers by means of thermal convection around the sensor or by causing thermally induced tilts.

Recently, we observed a semi-diurnal (12.0 hr) modulation of LP seismic noise amplitudes in seismometers in Portugal, SW Europe. This modulation was associated with the variation of atmospheric pressure, the only environmental signal to display a dominant 12-hr periodicity (at some locations). In this presentation we will present an analysis of this semi-diurnal modulation of long-period seismic noise. We show that the modulation: 1) is not instrument dependent, being recorded in a variety of sensors; 2) is observed in stations in mainland Portugal, Madeira island (N Atlantic), Florida (USA) and Mozambique, where it is strongest; 3) is seen only at a minority of sites without a clear geographical association, thus appearing to be strongly site-dependent; 4) is stronger during the Summer than during the Winter; and 5) is more clearly seen on vertical components. We will use data from the Transportable Array (EarthScope, USA) to investigate the admittance between LP seismic noise variations and co-located atmospheric pressure measurements.