



First results of cross-correlation analysis of ambient seismic noise from the Hellenic Unified Seismic Network

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In this study we present phase velocity maps that were obtained from the cross-correlation analysis of ambient seismic noise recorded in the region of Greece. We used one year (2013) of ambient seismic data obtained from the vertical component of 64 broadband permanent seismological stations that are part of the Hellenic Unified Seismic Network. Inter-station distances between these stations ranged from 60 to 840 km and the number of station pairs was 2054. All signals were corrected for instrument response, the trend was removed and the mean was subtracted. The data of each station was split in 4 hr time windows. Each window was systematically searched to remove earthquake signals and instrument problems and then the remaining 4 hr windows were spectrally whitened. For the last stage of the processing, the 4 hr data of each station pair were independently cross-correlated and then were stacked over the whole year into one time-series. This cross-correlation function contains the causal and acausal part of the Green's function of the medium between these two stations. Because ambient noise sources are not uniformly distributed, these two parts of the Green's function (causal and acausal) are not identical. In our analysis we used the part of Green's function that has the strongest and cleanest amplitude. Then, the individual phase velocity dispersion curves are obtained for all the cross-correlation functions by using frequency time analysis. Finally, the phase velocity curves are used to create phase velocity maps in the period band of 8 to 30 sec. These maps in a later stage will be inverted for shear-velocity structure.