



Searching for structural medium changes during the 2011 El Hierro (Spain) submarine eruption

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Submarine volcanic eruptions are often difficult to study due to their restricted access that usually inhibits direct observations. That happened with the 2011 El Hierro eruption, which is the first eruption that has been tracked in real time in Canary Islands. For instance, despite the real-time tracking it was not possible to determine the exact end of the eruption. Besides, volcanic eruptions involve many dynamic (physical and chemical) processes, which cause structural changes in the surrounding medium that we expect to observe and monitor through passive seismic approaches. The purpose of this study is to detect and analyse these changes as well as to search for precursory signals to the eruption itself using ambient noise auto and cross-correlations.

We employ different correlation strategies (classical and phase cross-correlation) and apply them to field data recorded by the IGN network during 2011 and 2012. The different preprocessing and processing steps are tested and compared to better understand the data, to find the robust signatures, and to define a routine work procedure. One of the problems we face is the presence of volcanic tremors, which cause a varying seismic response that we can not attribute to structural changes. So far, structural changes could not be detected unambiguously and we present our ongoing research in this field.