



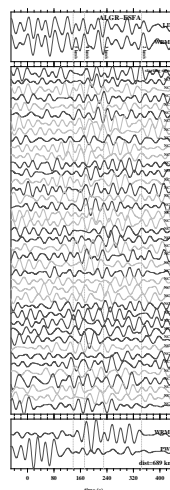
Extracting optimum inter-station empirical Green's function in west-central Brazil

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Abstract

The basic idea for retrieving inter-station empirical Green's functions (EGFs) using ambient seismic noise is well described in a homogeneous distribution of energy and/or sources in the study area. Several researchers considered the effect of inhomogeneous noise sources distributions on the extracted EGFs. For this purpose, some studies suggest the singular value decomposition (SVD) technique for obtaining inter-event EGF signals. However, the other ones calculated the error of calculated velocity with homogeneous in comparison of inhomogeneous noise source distributions in a ray-theoretical derivation/framework for far-field surface waves. Although many researchers apply the average of causal and acausal cross-correlation functions (CCFs) over a long time spans to obtain stable inter-station EGFs, this constraint is not enough to retrieve stable EGFs even for the inhomogeneous noise sources within the stationary zone. In this study, we considered estimating the effect of the noise source distributions on retrieved inter-station EGF signals within west-central Brazil. For this purpose, we computed CCFs from synthetic ambient seismic noise on the assumption of homogeneous and inhomogeneous distribution of noise sources' energy. Afterward, the inter-station EGF is retrieved using different stacking methods (e.g., linear, phase weighted stacking etc.) and then some critical constraints are obtained by comparison between the true and calculated EGF signal. These constraints are summarized as separating CCFs emanated by stationary sources (using the signal-to-noise ratio > 1 , signal-to-zero-lag ratio > 1), control the repetition of sources (by counting energy's packages), normalization of the energy of each source and stacking coherent CCFs. Finally, the possibility of extraction optimum EGF is considered in presence of these constraints on the dataset recorded in west-central Brazil. This dataset collected from five sub-networks.



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