



Preliminary studies of applied seismology in the region with a high erosion rate in Fercal-DF

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In 1989, Nakamura showed that the spectral ratio between the horizontal and vertical components can be used to estimate the resonance frequency and amplification of ground motion influenced by a surface layer. This approach has been used by many seismologists and engineers in recent years with the aim of characterizing small-scale seismic risk and providing detailed information for seismic microzoning in urban areas. In principle, this procedure has several advantages: only one seismic station with three components is needed, and it is not necessary to wait for an earthquake to occur, as microtremors (noise) provide the input movement. The horizontal-to-vertical spectral ratio of ambient noise is commonly used to infer the resonance frequency of a location (f_0 , location). The objective of this work is to apply a new statistical method to account for the azimuthal variability in the peak frequency of profile curves in the administrative region of Fercal. The region is characterized by rugged terrain, simple buildings, and active mining operations in the cement industry. Currently, there is no assessment of the seismic risk caused by site-specific amplification of seismic ground movements due to the presence of unconsolidated artificial cover. The study area has a high rate of erosion and the preliminary result shows by HVSR that its resonance frequency ranges between 0.23-0.55 Hz and only one estimate out of this range.