

## Hidden geometries reconstruction and site effects estimation: first results from geophysical investigations in the Valle Umbra basin (central Italy)

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The Valle Umbra is a NW-SE 20 km long and 10 km wide Quaternary alluvial basin located in the internal sector of the active extensional tectonic Apennine chain, central Italy.

This area historically suffered major earthquakes such as in 1832 (ME=6.3; IO=X) and 1854 (Me=5.6; I=VIII). It was marginally affected by the Colfiorito earthquake (M 6.0; September 1997) and more recently suffered from damages to buildings caused by the 2016-2018 Amatrice-Visso-Norcia seismic sequence.

This work is about the application of geophysical techniques aimed at the reconstruction of the hidden structures of the Valle Umbra basin (central Italy). We decided to perform a single station ambient noise campaign to investigate the subsoil and try to identify and distinguish the different geological units and retrieve their trend in the subsoil all along the valley. From the results of HVNSR analysis we could identify the main impedance contrast on the subsoil due to the superimposition of lithological layers with different density and velocity of propagation of seismic waves.

Additional constraints for the site effects estimation come from results of spectral ratios techniques applied on a dataset of earthquakes acquired by the accelerometric station IT.CSA of the national civil protection located in the middle of the valley and from the shear wave velocity profile retrieved for the seismic characterization of the site.