



Site effects in the Pollino region from the HVSR and polarization of seismic noise and earthquakes

Ferdinando Napolitano (1), Anna Gervasi (2,3), Mario La Rocca (2), Ignazio Guerra (2), and Roberto Scarpa (1)
(1) Dipartimento di Fisica, Università degli Studi di Salerno, Italy (fnapolitano@unisa.it, rscarpa@unisa.it), (2) DIBEST, Università della Calabria, Italy (mario.larocca@unical.it, ignazio.guerra@unical.it), (3) Istituto Nazionale di Geofisica e Vulcanologia, Italy (anna.gervasi@ingv.it)

Site effects have been studied at 15 sites in the Pollino region (Southern Italy) through the analysis of seismic noise, local and regional earthquakes by applying the horizontal-to-vertical spectral ratio and polarization methods. The spectral ratio HVSR method has been applied to at least 20 hours of seismic noise selected at each site by taking into account day and night hours, and week days during several months in order to include any possible environmental conditions, with the aim to investigate site effects in the 0.5 – 20 Hz frequency band. Results show stable HVSR curves characterized by low standard deviation at each site, without noteworthy peaks at most stations. The same analysis was also applied to S waves and early coda waves of 83 local and regional earthquakes for a total amount of 276 HVSR curves, showing results very similar to the HVSR curve obtained from the seismic noise at most of the sites. In some cases the HVSR is essentially flat, characterized by amplitude levels between 0.7 and 2 in the entire considered frequency band, thus indicating no relevant site effects. Other sites show well defined peaks of amplitude up to 4. In some cases, as for instance at MMN, MMN2, MMN5 and T0713, it is clear a discrepancy between earthquakes and noise HVSR curves. To improve the interpretation of the results, the relationship of site effects seen in the HVSR curves with the local structure have been further investigated through polarization analysis of seismic noise. Results indicate that topography gives the main contribution to site effects in four cases, while the effects possibly associated with fault zones nearby some stations are less obvious.