



Scattering images of active volcanoes: Campi Flegrei and Vesuvius

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The three dimensional distribution of crustal scatterers in the Campi Flegrei and Vesuvius volcanic areas, Southern Italy, are estimated using an inversion analysis of coda envelopes from local VT earthquakes. In the Campi Flegrei analysis we used 718 events collected at 10 3-D digital stations during the last bradiseismic uplift episode of 1983-1984. For Vesuvius the data set was made of 2261 events recorded in the period 1996-2000 by 16 short-period high-dynamic range seismic stations of the seismic monitoring network of INGV Naples. In both cases a modified Nishgami's approach was applied. The band pass filtered coda envelopes were compared to smooth coda decay calculated for each station averaging the normalized coda envelopes. This procedure is independent on the scattering model assumption. The main difference between the two cases was the velocity distribution used in the ray tracing: we used a constant model for the Campi Flegrei while in the Vesuvius analysis we took into account the 3-D velocity distribution found using velocity tomography (Scarpa et al. 2002).

With this study we investigate on the relationship between velocity, attenuation and elastic heterogeneity within the volcano to help us better interpret the relationship between structure and volcanic processes. To this purpose we compare the scattering image with other analysis made on the same areas. In particular in the Vesuvius analysis we find low scattering within the high velocity /high Q zones under the Vesuvian cone.