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2D and 3D attenuation tomographies at Mt. Etna (Italy)

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2D and 3D attenuation structures of Mt. Etna have been obtained with measurements of diffusion model and coda-normalization method, respectively, with the same data-set used to develop the 3D velocity tomography (Diaz-Moreno et al. 2016). We have obtained intrinsic and scattering 2D maps applying the diffusion model which is an approximation of the general energy transport theory developed by Wegler and Lühr (2001) and Wegler (2003). As a result of the theoretical curves with the energy envelopes of the seismograms, we have obtained intrinsic attenuation coefficient and diffusivity coefficient values in the frequency range of 4-24 Hz. Then, we have quantified the contribution of intrinsic and scattering attenuation by inverse quality factor being more representative. Finally, with a new representation method based in numerically estimated space-weighting functions, we have represented the inverse quality factors obtained into 2D contour maps. To obtain 3D attenuation tomography of Mt Etna, we have used more than 60000 waveforms recorded at over 100 onland seismic stations. The rays were traced in a 3D velocity model. We have inverted the spectral ratios obtained with the coda normalization method to obtain total-Q values. We resolve 5 km cubic cells. Both results, 2D maps and 3D attenuation structure, have shown that there is likewise agreement with the velocity tomography: the low velocity zones being consistent with regions featuring high attenuation effects and the high velocity zones with regions featuring low attenuation effects. This new models will be a complement to the better understand previous geophysical models and will allow remove some grades of uncertainty of the other studies.