



The intrusive process leading to the Mt. Etna 2001 flank eruption: constraints from 3D Q_p model.

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We have analyzed 291 shallow seismic events, leading to the July 17-August 9, 2001 flank eruption at Mt. Etna volcano, to obtain high resolution three-dimensional (3D) images of seismic attenuation of P waves (Q_p) down to 2 km depth. 2293 P wave spectra have been inverted for seismic attenuation to calculate t^* values, considering a frequency-independent Q, and a w2-type source model. The 3D tomographic images reveal an anomalous region of very low Q_p values (between 10 and 30), located in the same place where the 2001 dike emplaced. We interpret this anomaly as the effect of fluid intrusion (magma rich in gas) in the uppermost part of the Etna volcano, just before the 2001 eruption. This confirms that attenuation is a physical parameter sensitive to the thermal state of crustal volumes through which seismic waves travel.