



Tomographic images of Northeastern Sicily and Southern Calabria crust by using TomoDD algorithm

G. Barberi (1), D. Patanè (1), L. Scarfi (1) and H. Zhang (2)

(1) Istituto Nazionale di Geofisica e Vulcanologia, Sezione di Catania, Catania, Italy
barberi@ct.ingv.it / Phone: +39-0957165800, (2) University of Wisconsin-Madison;
Department of Geology and Geophysics, 1215 W. Dayton St., Madison, WI 53706, United States

In the present study a seismic wave velocity tomography in the region including Northeastern Sicily and Southern Calabria has been performed. The used dataset consisting of P and S arrival times from a thousand of shallow earthquakes (< 30 km) recorded by the local and national seismic INGV networks between 1994 and 2005. The dataset was inverted by the double-difference algorithm of TomoDD (Zhang and Thurber, 2003) for simultaneous computation of hypocenter parameters and V_p and V_s three dimensional distributions. This method allow to determine a three-dimensional (3D) velocity model jointly using the absolute and relative event locations. We also estimated the differences between the results obtained using the standard tomography (Thurber, 1983), and DD tomography (Zhang and Thurber, 2003). The DD results show that the events are more concentrated and that the velocity structures using just absolute and differential catalog data are somewhat sharper compared to standard tomography. Finally, the tomographic results are analyzed jointly with the geophysical and geological information available in the literature in order to improve our knowledge of the crustal structure and seismogenetic faults in the area.