



Crustal seismotomography and shallow earthquake locations in south Italy

A. Gervasi (1, 2), I. Guerra (1), G. Neri (3), **B. Orecchio (3)**, D. Presti (3)

(1) Dept. of Physics, University of Calabria, Arcavacata di Rende (CS), Italy

(2) National Institute of Geophysics and Volcanology, CESIS , Grottaminarda, Italy

(3) Dept. of Earth Sciences, Messina University, Italy (orecchio@unime.it)

About 63000 P- and 35500 S-wave readings from natural and artificial sources were used to improve the sketch of the space distribution of P velocity and V_p/V_s ratio in the crust of Southern Italy (36.5°-41.5°N 12.5°-18.0°E) by means of inversion algorithms of the SIMUL and TOMODD series.

Spread Function computations and checkerboard and restore tests showed that the accuracy of the new velocity estimates in the upper 30 km beneath Calabria is significantly higher than the previous ones.

The obtained three-dimensional velocity model produced a remarkable improvement in hypocenter locations of the whole earthquake dataset (more than fifteen-thousand events) with particular reference to shallow seismicity in Calabria. Tests have been performed to check the stability of hypocenter locations when varying the velocity structure within the uncertainty ranges of the inverted parameters. Hypocenter locations of major activity phases and swarms occurred between 1994 and 2001 were found to be highly stable and suitable for comparison with mapped faults and geological features, opening new perspectives to local-scale geodynamic modelling.