



INVESTIGATING P, S VELOCITY STRUCTURE AND VP/VS RATIO BENEATH THE
WHOLE MARMARA REGION AND SURROUNDING FROM LOCAL EARTHQUAKE
TOMOGRAPHY

Gulten POLAT¹, Nurcan Meral OZEL¹, Ivan KOULOKOV², and Stuart CRAMPIN³

We have investigated the crustal structure beneath the Marmara region and also western part of the North Anatolian fault zone (NAFZ) where have high seismicity and has critical significance for the earthquake hazard. This study is based on local earthquake tomography using the moderate size and particularly micro earthquakes occurred in this study area, recorded by TURDEP (Multi-Disciplinary Earthquake Research in High Risk Regions of Turkey) and KOERI (Kandilli Observatory and Earthquake Research Institute). We derived 2065 earthquakes and 91609 arrival times, in total, consisting of 49245 P-wave and 42364 S-wave arrival times. In this study, we present detailed crustal structures for VP, VS, and the VP/VS ratio based on the iterative inversion for both VP-VS and VP-VP/VS using the LOTOS code from the surface down to 30 km depth. The hit count analysis of seismic rays and the checkerboard tests are also done for the region. The results obtained from the inversion suggest that the western part of the North Anatolian Fault Zone shows strong lateral heterogeneity. We concluded that a clear pattern exists between the distribution of micro earthquakes and the velocity perturbations presented in this study.

¹Bogazici University, Geophysics Department, Kandilli Observatory and Earthquake Research Institute(KOERI), Cengelkoy/Istanbul, Turkey, gultenpolat2005@gmail.com

²IPGG, SB RAS, 3, Prospekt Akademika Koptyuga, 630090, Novosibirsk, Russia, KoulakovIY@ipgg.nsc.ru

³Hon. Research Associate, British Geological Survey, Murchison House-West Mains Road, Edinburgh EH9 3LA, SCOTLAND U.K., scrampin@ed.ac.uk