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Preliminary Results of 2-D Modelling Studies From Cyprus Arc Project Explosion Seismic Data

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This study is a part of the Cyprus Arc project and comprises a 300 km long seismic wide-angle reflection/refraction (WRR) profile between Salt Lake and Anamur in central Turkey and a 45 km long seismic profile in Southern Cyprus which were completed in spring 2010. The locations of the profiles were determined to be more or less perpendicular to the complex tectonic structure of the Eastern Mediterranean which is dominated by the Cyprus Arc. The Cyprus Arc is widely accepted as a subduction zone which was active beneath Cyprus until the early Miocene. The seismic measurements comprised two onshore shots and airgun shots offshore that were recorded by 143 three-component and 101 one-component instruments. Stations were averagely spaced with 1.25 km along the whole length of the N-S trending profiles in Turkey and Southern Cyprus. In this study, crustal velocity structure models along the profiles were derived by using finite-difference ray tracing. The models were further refined using forward modeling to generate synthetic seismograms for individual shot gathers. Thus by varying the velocity structure the theoretical times and amplitudes of the various arrivals could be matched to the observed times and amplitudes. Additionally, 2-D gravity modelling was done by using the obtained crustal model to generate theoretical gravity data and comparing these data with the observed gravity data.

Key words: Controlled source seismology, central Anatolia, Cyprus arc, ray tracing