



Cluster analysis of indermediate deep events in the southeastern Aegean

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The Hellenic subduction zone (HSZ) is the seismically most active region in Europe where the oceanic African lithosphere is subducting beneath the continental Aegean plate. Although there are numerous studies of seismicity in the HSZ, very few focus on the eastern HSZ and the Wadati-Benioff-Zone of the subducting slab in that part of the HSZ. In order to gain a better understanding of the geodynamic processes in the region a dense local seismic network is required. From September 2005 to March 2007, the temporary seismic network EGELADOS has been deployed covering the entire HSZ. It consisted of 56 onshore and 23 offshore broadband stations with addition of 19 stations from GEOFON, NOA and MedNet to complete the network.

Here, we focus on a cluster of intermediate deep seismicity recorded by the EGELADOS network within the subducting African slab in the region of the Nisyros volcano. The cluster consists of 159 events at 80 to 190 km depth with magnitudes between 0.2 and 4.1 that were located using nonlinear location tool NonLinLoc. A double-difference earthquake relocation using the HypoDD software is performed with both manual readings of onset times and differential traveltimes obtained by separate cross correlation of P- and S-waveforms. Single event locations are compared to relative relocations. The event hypocenters fall into a thin zone close to the top of the slab defining its geometry with an accuracy of a few kilometers. At intermediate depth the slab is dipping towards the NW at an angle of about 30° . That means it is dipping steeper than in the western part of the HSZ. The edge of the slab is clearly defined by an abrupt disappearance of intermediate depths seismicity towards the NE. It is found approximately beneath the Turkish coastline. Furthermore, results of a cluster analysis based on the cross correlation of three-component waveforms are shown as a function of frequency and the spatio-temporal migration of the seismic activity is analysed.