



Moment tensor solutions in Low Kura depression of Azerbaijan

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We have attempted in this work to provide moment tensor solutions for small and moderate earthquakes in the region. The analysis was performed using data coming from the permanent Azerbaijan broadband seismic network (Kinematics Inc, USA) , run by 2003 (Fig. 1). We applied the “Cut And Paste” (CAP: Zhu and Helmberger, 1996) method based on broadband waveform inversion. The source depth and focal mechanisms are determined using a grid search technique.

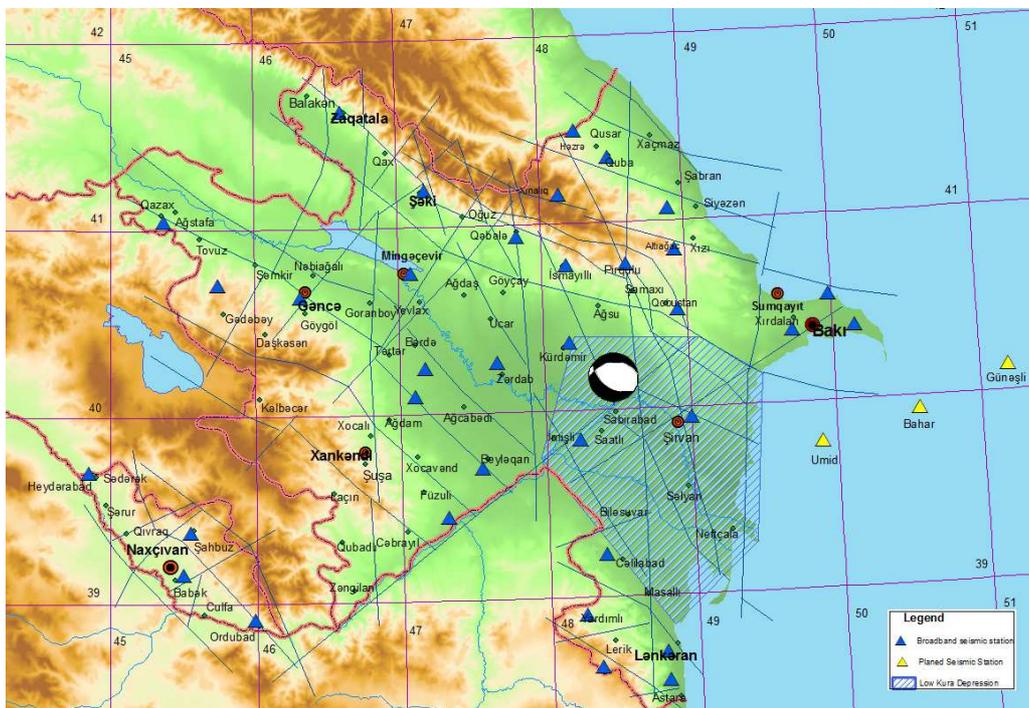


Fig.1 Normal fault of Hajigabul earthquake $m_l=5.7$, 12:06:46UTC, 10.02.2014 in Low Kura Depression (Gurban Yetirmishli¹, Vugar Furajov¹, Sabina Kazimova¹ www.seismology.az)

The method allow time shifts between synthetics and observed data in order to reduce dependence of the solution on the assumed velocity model and on earthquake locations. In order to get reliable source mechanisms, using waveforms, it is necessary to compute synthetic seismograms, which in turn requires a reasonable velocity/attenuation model for generating Green's functions. We used the frequency–wavenumber (F–K) integration method as described by Zhu and Rivera (2002) to compute Green's functions for a distance range from 5 to 500km with a spacing of 5 km and a focal depth range from 2 to 60 km. We used the 1-D velocity model proposed for the area and added densities based on the Nafe–Drake relation (Ludwig et al., 1970). Qp and Qs values are similar to those used by other researchers. The Qp and Qs values are not critically important because we were dealing with relatively short propagation distances and low frequencies. This method, successfully applied also in the case of earthquakes with magnitude lower than 3 in other regions (D'Amico et al. 2010, 2011, 2013), furnishes good-quality solutions in the area in a magnitude range not properly represented in the official databases and in the major literature. The study of faulting parameters and depths of the small-to-moderate-size events can contribute much to our understanding of the regional stresses

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