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A Receiver Function Study in Kope-Dagh (Iran) Using Short Period Data

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Geographic location of Iran plateau between Arabia and Eurasia plates caused the Iranian plate to be in a high pressure condition. Configuration and tectonic structures procedure in this region is affected by motions of these plates. With respect to this fact that the Iran plateau is in a high pressure situation, it is expected that the main construction of contractions and faults in this region to be reverse or thrust. Kope Dagh region has the same configurations and tectonic structures process. So, this region considered as an active tectonic region. Thus, the study of its crust is essential to locate the future earthquakes.

The depth of Moho is an important parameter to characterize the overall structure of a crust and can often be related to geology and tectonic evolution of the region. In this study, we use the teleseismic receiver function technique to determine the crustal thickness and Vp/Vs ratios for 6 stations in Kope Dagh region. The teleseismic receiver function represents the structural response near a recording station to the incoming teleseismic P wave. The first-order information about the crustal structure under a station can be derived from the radial receiver function which is dominated by P-to-S converted energy from a series of velocity discontinuities in the crust and upper mantle. Because of the large velocity contrast at the crust-mantle boundary, the Moho P-to-S conversion is often the largest signal following the direct P.

In this work, the teleseismic waves, which had been registered by the 6 stations of the Ghuchan and Mashhad seismic networks have been processed using the P receiver function method to calculate the Moho depth beneath the Kope Dagh region. We used the available short period data. Our results showed a Moho depth of approximately 45 km on average, which varies between 41 and 49 km. These results confirmed the previous results obtained from other studies in this region. We calculated also P and S receiver functions for a single broadband station and compared our results with those obtained from short period stations in Kope Dagh.