



Variations in the Fault Plane Solutions and in the Magnitudes of Earthquakes Occurring in the Anisotropic Region

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Seismic sources in anisotropic medium have more complex moment tensor structures compared with the moment tensors of isotropic medium. It is a well known fact that shear sources in an isotropic medium generate pure double-couple (DC) moment tensors. However in an anisotropic medium, shear sources can generate moment tensors with DC, compensated linear vector dipole (CLVD) and isotropic (ISO) components. The DC, CLVD and ISO percentages of a moment tensor depend on the magnitude and the orientation of the anisotropy. In this study, we choose five fundamental fault types namely, left/right lateral strike slip, normal, reverse and dip-slip faults in a medium with four different anisotropy classes; isotropic, transversely isotropic, orthotropic and monoclinic. We rotated the anisotropic elasticity tensors of the medium for every possible orientation and evaluate the moment tensors of each cases. Then moment tensor decomposition is applied and DC, CLVD and ISO components are found. We plot the DC, CLVD and ISO percentages of the moment tensors generated by different fault types and anisotropy classes. By using the DC components, first we obtained fault plane orientation then we calculate the deviation from the original fault mechanism and the moment magnitude. Effects of anisotropy of the source region on calculated fault parameters and moment magnitude are found.