

The Analysis of Stress-Forecast with Manyas-Kus Golu Earthquake

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A Mb=5.3 Manyas earthquake has been "stress-forecast" by using variations in time delays of seismic shear wave splitting to evaluate the time and magnitude at which stress-modified microcracking reaches fracture criticality within the stressed volume where strain is released. Therefore, we processed micro earthquakes recorded by 29 installed in the TURDEP (Multi-Disciplinary Earthquake Research in High Risk Regions of Turkey) project and also 33 from KOERI (Bogazici University, Geophysics Department, Kandilli Observatory and Earthquake Research Institute) stations in the Marmara region by using the methods: the aspect ratio method, cross-correlation method and systematic analysis of crustal anisotropy. The aim of the analysis is to determine delay time changes before and after the Manyas earthquake. We observed that clear decreases in delay times before the impending event at especially GEMT are very consistent with Anisotropic Poro Elasticity (APE), but we could not observe same changes at othe stations surrounding the main event. The logarithms of the duration of the stress-accumulation are proportional (self-similar) to the magnitude of the impending event. Considering variations in splitting parameters before and after the main earthquake, it is very hard to conclude that location of the forecast earthquake can be forecasted. The study gets an example Local investigations indicated the approximate location of the forecast earthquake.

Keywords: Stress Forecast, Shear Wave Splitting, Anisotropic Poro Elasticity