EARTHQUAKE INTERACTION ALONG THE SULTANDAGI-AKSEHIR FAULT BASED ON INSAR AND COULOMB STRESS MODELING

Deepak Manjunath

Dr. Francisco Gomez, Thesis Supervisor

ABSTRACT

The evolution of geologic structures along active faults is influenced by crustal deformation associated with several repetitions of the earthquake cycle, in addition to surficial processes accompanying geologic time. This study focuses on the Sultandagi-Aksehir Fault (SAF), which bounds the Aksehir-Afyon graben and the Sultan Dag range, in southwestern Turkey. During the past decade, a sequence of moderate-size earthquakes occurred along the SAF, including a M_w 6.0 earthquake (December 15th, 2000) and a M_w 6.5 earthquake (February 3rd, 2002). This study investigates the 2000-2002 earthquakes with respect to coulomb stress migration and the implications of the same in terms of stress changes on adjacent fault segments. To address the objectives of the study, maps of co-seismic surface displacements were produced using Synthetic Aperture Radar Interferometry (InSAR). Elastic dislocation models were used to estimate faulting parameters from the co-seismic displacement maps. The fault models were then used to estimate static coulomb stress changes resulting from the earthquakes. The findings suggest that although the two events of December 15, 2000, were not directly related to one another in terms of stress triggering**,** both events can be related to the 2002 earthquake in terms of stress triggering and extent of rupture.