



FAULT INTERACTION BY DYNAMIC STRESS TRANSFER: THE CASE OF THE 2000 SOUTH ICELAND SEISMIC SEQUENCE (PROJECT EVG1 PREPARED)

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We investigate a case of short-term and long-range fault interactions during a seismic sequence. This kind of fault interaction is generally ascribed to the dynamic stress distribution caused by the main earthquakes of the sequence. After the first $M_W = 6.5$ earthquake of year 2000 in the South Iceland Seismic Zone (SISZ), here called the main event, a series of earthquakes followed immediately to a distance of 100 km along the SISZ and its prolongation along the Reykjanes Peninsula. We considered in particular the first two largest events recorded by the digital local seismic network after the main shock, within 1 minute of its occurrence. These events were located at a distance of about 70 km from the main event, near one of the main geothermal areas of Iceland. We computed the dynamic Coulomb Failure Function variation $\Delta CFF(t)$ produced by the main event at the hypocenters of the two aftershocks, assuming a layered crustal model that reproduces the main features obtained by tomographic studies. We assumed the fault geometry of the main event, as that inferred by geodetic data. The code used to compute the dynamic stress is based on the discrete wave-numbers and the reflectivity method. Our preliminary results show that at the hypocenter of the second event the peaks of $\Delta CFF(t)$ occurred later than the corresponding peaks at the hypocenter of the first event, with a mean temporal separation comparable with the difference of the origin times of the two events. Moreover the two aftershocks occurred at or followed closely a peak of ΔCFF . These results are compatible with the hypothesis of instantaneous dynamic triggering. To further investigate this possibility, we also evaluated the response of a spring-slider model of fault with a rate- and state-

dependent friction caused by a perturbation either in shear and in normal stress, such as that synthetically determined at the hypocenter of the events studied.