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# A diffusive model for the seismicity following the May 6. 1976 M=6.5 Friuli (Northern Italy) event

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Several examples support the idea that the stress released by an earthquake, or even artificially generated, for example, by reservoir or borehole infilling, can at least in part be transferred, and that other earthquakes at different locations and times may result. In the context of the seismicity which followed the M=6.5 compressive event of May 6., 1976 in Friuli, Northern Italy, and using an improved data base of the epicenters, we examine the diffusion of fluids in a porous medium as a possible mechanism to transfer stress away from a main earthquake. We test the hypothesis that each triggered earthquake releases a strain close to the strain induced by the incoming hydraulic head in the porous medium, at times and distances from the main event complying with a diffusion law. A fit of the equivalent strain data released by individual earthquakes of M $\geq$ 4.8 to the solution of the diffusion equation constrains the diffusion coefficient to 3 $\pm$ 0.5 m2/sec. Most of the events from magnitude 3.8 to 6.3 in the time window June 15, 1976 to February 28, 1977, and falling within 50 km from the epicenter of the May 6, 1976 event, are found to be spatially, temporally and energetically consistent with the transit of the hydraulic head. The other events in the month immediately following the main event can be modeled by static or dynamic stress transfer, which involve shorter time scales. The hypocentral depths are known with low accuracy but are unlikely to differ from the main event (4-8 km). The aftershocks seismic sources are consistent with the attitude of thrusts mainly involving the South-Alpine sedimentary sequence. This suggests that the propagation of the hydraulic head is controlled by the regional fault architecture. The diffusion along fractured rocks explains the higher value of the diffusion coefficient relative to typical values reported in the laboratory for bulk rocks.