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Dynamic Fault Rupture Propagation in Agarose-gel
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We report on the experimental observation of mode-II crack propagation along a weak plane in agarose-gel. Agarose gels of three different concentration(1, 2,and 3 wt%) are prepared and their rheological properties are measured. In the experiment, transparent agarose-gel which contains straight weak plane is applied constant load. The position of crack tip is tracked by means of photoelastic visualization. We observed evolution of rupture front from slow nucleation to fast, unstable propagation. Observed terminal velocity of rupture propagation for 1wt%-gel is typically about 4m/s, which is corresponding to shear wave velocity of the gel. Terminal velocity and critical crack size are compared with theoretical expectations.

We also discuss the capability of the experiment to investigate the earthquake rupture process.
Keywords: fracture experiment, fault dynamics, fault nucleation, laboratory experiment, photoelasticity, gel