

SSS025-P10

Room:Convention Hall

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Subsidiary multiple crack generation during unstable fast rupture in Agarose-gel fault

Satoshi Fujita^{1*}, Osamu Kuwano¹, Tetsuya Kusakabe¹, Yuuki Kodera¹, Nobuki Kame¹, Masao Nakatani¹

¹ERI, The University of Tokyo.

It is well known that earthquake faulting is followed by shear rupture propagation. It is very hard to see dynamic faulting under the ground. In order to observe such a shear rupture many attempts are done in experiments that samples with photo-elasticity are broken under a uni-axial loading and dynamic rupture nucleation is triggered by a explosion. It is, however, far from the actual earthquake nucleation that starts spontaneously. Here we try to nucleate dynamic rupture spontaneously.

We made gel plates (250x400x10mm) including a weak plane, and set it under an uni-axial compression. The gel has two advantages over rock samples. One is that the stress field of sample can be observed by photoelasticity. Another is that dynamic rupture is easy to be observed because of the significant low s-wave velocity, 7m/s. We change strength of the weak-plane so that we can control generation of subsidiary cracking off the main rupture.

We successfully generated subsidiary off-fault cracks when the weak-plane strength is relatively high. We observe significant deceleration of rupture velocity of the main fault during growth of subsidiary cracks. This can be attributed to the energy consumption due to increase of surface energy.

We also discuss geometry of off-fault comparing to theoretical prediction.