

Extended finite element method(X-FEM) for spontaneous rupture propagation

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We apply an extended finite element method(X-FEM) to spontaneous rupture propagation on a planar fault. Mesh layout of X-FEM does not require to match the fault plane with the mesh edge because a discontinuity of the displacement can be analysed inside the element. In order to apply X-FEM to spontaneous rupture propagation, we control slip displacement by adopting geometrical boundary conditions and traction by adopting kinetic boundary conditions. Simulated results for the cases of variable dip angles in a homogeneous full 2-D space agree well with simulated ones by boundary integral equation method(BIEM). We also discuss the results for the cases of variable dip angles in a homogeneous half space, which are simulated on the same mesh layout.