

Brittle-plastic transition in Kintaro-ame

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The cut-off depth of seismicity is controlled by rheological properties of crustal materials. The fault slip is suppressed with increasing confining pressure, and the plasticity of rocks is enhanced with increasing temperature. The seismogenic zone is a region where the dominant deformation mechanism is brittle fracture. The change from brittle fracture to plastic flow should be transitional.

Our problem is the seismic activity in this transition zone. In order to understand the nature in the transition regime, we perform an analog experiment using a candy.

We employ 'Kintaro-ame' (D=17mm, L=170mm) as a working material. It shows brittle-plastic transition near the room temperature. Three-point bending is applied to a candy-stick with a linear pulse-motor. We perform bending tests with different displacement rates and temperatures, and make a deformation mechanism map. We will report the deformation mechanism map and characteristics of fractures.