Two-dimensional observations of dynamic slip propagation

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Crustal earthquakes are considered to be caused by dynamic slips on the faults. Models for dynamic slip have been developed from mass-spring models to one-dimensional constitutive friction laws. The one-dimensional constitutive laws, however, are insufficient since the rupture propagation is controlled by two-dimensional interactions between asperity contacts. In the seismic waveform inversion, the rupture velocity is usually assumed to be around the surface wave velocity on the basis of the theoretical studies. Does dynamic slip propagate at surface wave velocity under the two-dimensional interactions of asperity contacts? In this study, we carried out the frictional tests using a sample which contains sensors on asperities, and discussed the two-dimensional propagation of dynamic slip.