

Quantification of gaps between slip-length scaling law of earthquakes and stick-slip experiments.

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Scaling relations of natural earthquake (over km scales) have been well studied, but their extension to smaller scales is difficult because of limited observation resolution. This study focuses on experimental stick-slip data and compares them with a slip-length scaling law of natural earthquakes. There seem gaps between the extension of the earthquake scaling and the stick-slip experiments. Here we perform correlation and multivariate analyses to investigate effects of apparatus type, mass and stiffness on the gaps. We find that a characteristic time composed of the mass and the stiffness shows a strong correlation with the gaps against the natural scaling in case of direct shear apparatus.

Keywords: stick-slip, earthquake slip-length scaling