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## Fault (un-)stability and strain partitioning across the brittle-ductile transition

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In the lithosphere, the transition from brittle to ductile deformation corresponds to a regime where brittle fracturing and plastic flow coexist, called the semi-brittle deformation zone. Within these different regimes, a large fault slip spectrum has been observed, from fast to slow earthquakes. Studying the parameters controlling fault (un-)stability and strain partitioning across this transition is fundamental to understand how natural faults behave at varying crustal depths.

To investigate semi-brittle deformation and the conditions promoting it, we report here the results of experiments performed on Carrara marble saw-cut faults in triaxial conditions. We studied the influence of the confining pressure, axial loading rates and initial fault roughness on fault (un-)stability. From mechanical data, we performed strain partitioning calculations to infer elastic, frictional and plastic strain contributions during the deformation process.

We conclude that (laboratory) earthquakes may nucleate within a regime where homogeneous plastic deformation of the bulk and dynamic fault slip may coexist. The contribution of plastic strain is promoted with increasing confining pressure and fault roughness.