



Very Slow Friction Experiment (VSFE)

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We have devised a very slow friction experiment (velocity ranging from 0.1 up to 500 $\mu\text{m/s}$) to investigate the frictional behaviour of a block slider. The sample is under normal load and a shear displacement is applied with a constant rate. Both forces and horizontal and vertical displacements are recorded in time. The experiment is placed under a microscope that allows for a direct observation of the interface.

In a first step, we investigate the dry friction of a salt sample over a flat glass surface. As expected, a transition from stick-slip behaviour at low velocities to continuous sliding at large velocities is observed.

In a second step we investigate the effects of fluids on the frictional behaviour of the salt. To this aim, we perform an experiment with a sample of salt with a saturated brine confined along the salt glass interface and under normal load only. We are able to activate stress-enhanced dissolution-precipitation process (i. e. pressure solution). A vertical displacement up to 40 μm is measured. Meanwhile we follow the evolution of individual contact asperities surface area that grow with time.

Finally, we perform series of experiment with normal and shear stresses on a salt crystal in contact with a saturated brine. We activate the competition between pressure-solution and stick-slip behaviour.