# Bursts in the permeability of particle-laden flows through porous media

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Particle-laden flows experience deposition and erosion when passing through a porous medium, a common situation in many fields, ranging from environmental sciences to industrial filters and petroleum recovery. We experimentally study dense suspensions during deep bed filtration and find that the time evolution of pressure losses through the filter is characterized by jumps separated by time delays. These jumps are related to erosive events inside the porous medium and are preceded and followed by deposition. A statistical analysis shows that the events  are independent whose size distribution scales with a power law. The detection of such jumps provides new insight into the dynamics of particle-laden flows through porous media, specifically as they can be considered analogous to sand avalanches occurring in petroleum wells. The above phenomenon can be reproduced in an electrical network of fuse-anti-fuse devices, which become insulators within a certain finite interval of local applied voltages. As a consequence, the macroscopic current exhibits temporal fluctuations which increase with system size. We determine the conditions under which this itinerant conduction appears by establishing a phase diagram as a function of the applied field and the size of the insulating window.