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**Onset and cessation of grain motion in riverbed erosion experiments** JULIA SALEVAN, ABRAM CLARK, Yale University, MARK SHATTUCK, City College of New York, COREY O'HERN, NICHOLAS OUELLETTE, Yale University — Erosion due to fluid flow plays a principal role in shaping landscapes. However, the complexity of the coupling between hydrodynamic shear, sediment transport, and internal granular bed rearrangements limits our understanding of the particle-scale physics that governs erosion. In particular, it is unclear whether particle rearrangements in an immersed bed are controlled largely by fluid forcing or by mechanical instabilities in the network of interparticle forces, and how the onset and cessation of particle motion is linked to the prior shear history of the bed. To address these questions, we perform experimental studies in a recirculating water flume in which we drive turbulent flow across beds of glass beads. We use optical imaging to characterize both the turbulence and dynamics of the bed, and we study the differences in flow properties required to initiate and maintain particle motion.

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