Abstract Submitted
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A study of saltation process using hydrogel particles.[1] STELLA WANG, North Carolina School of Science and Mathematics, Durham ,NC, YUCHEN ZHAO, ROBERT BEHRINGER, Department of Physics, Duke University, Durham, NC — Saltation is a natural process for sediments transported by flow, and occurs in situations such as wind-driven sand dunes in the dessert, and rivers or streams where fluid motion drives gravel. The onset of grain motions is set by the strength of the shear, and grains exhibit rolling, successive jumping where they are lifted by the turbulence. It is an open issue as to how the grain size affects saltation transport, particle velocities and mass fluxes, etc[1]., and also how the in-elastic collision between grains affects saltation. Here, we describe a new saltation experiment using hydrogel particles immersed in uniform flow of water. Because the refraction indexes of particles and the fluid are nearly matched, the hydrogel particles can be imaged by a parallel light source, resulting in overlapping dark rings that not only reflect lateral positions, but also depths in one 2D image at one time. Mono-disperse particles are used and their size is adjusted by changing salt concentrations in the fluid. Preliminary results show that the softness of hydrogel particles leads to relatively large collisional losses. This property allows us to explore the phase diagram of saltation transport in the in-elastic collision regime.

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