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Impact and interaction of granular streams in waters BRIAN UTTER, ALEX CHRISTENSEN, EMILY HOBBS, Bucknell University, HARRY MANDELES, JACOB PARKHOUSE, James Madison University — We experimentally investigate the flow and interaction of granular streams in water, composed of either hydrophobic grains impacting a water surface from above or the interaction of two counter-propagating streams of non-hydrophobic particles. We characterize the stability and character of the aggregates formed in impacting jets with variations of hydrophobic concentration, stream diameter, and drop height. We find that increased hydrophobic grain concentration leads to increased aggregation due to an effectively cohesive interaction mediated by entrained air and, at lower concentrations, the stream exhibits a lateral instability. Under bidirectional flow, we observe a clogging transition and show that the jamming probability increases as a function of the number of beads in the system and decreases with channel diameter, and that the clog undergoes an instability with increased channel width due to lateral variations in particle density.

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