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Blowing in the wind: the dynamics of small laboratory-scale dunes YANG ZHANG, Department of Fluid Engineering, Xian Jiaotong University, WILLEM VAN DE WATER, Department of Applied Physics, Eindhoven University of Technology — Barchan dunes can be found in the desert under steady wind conditions where they translate unaltered in the direction of the wind. These remarkable natural patterns are the result of the interaction between sand and wind where the wind deposits the sand in heaps, which, in turn, change the properties of the turbulent wind. The length scales of these dunes, set by saltation of the grains, can be reduced dramatically by oscillating gravity. This makes laboratory experiments possible. We study the fate of tiny dunes sitting on an oscillating table in the turbulent boundary layer of a wind tunnel. Growth or death of these dunes depends on the influx of sand. Paradoxically, more influx can lead to more erosion. We explain this through a continuum model, and link its unknowns to detailed measurements of grain dynamics.

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