

Abstract Submitted  
for the DFD20 Meeting of  
The American Physical Society

**Mass exchange in barchan-barchan interactions**<sup>1</sup> WILLIAN ASSIS, ERICK FRANKLIN, School of Mechanical Engineering, University of Campinas (UNICAMP) — Barchan dunes grow under one-directional fluid flow and limited amount of granular material. They are usually organized in barchan fields, where dune interactions control the behavior of the entire field. In a previous study [Assis and Franklin, *Geophys. Res. Lett.*, submitted], we investigated barchan-barchan interactions in the subaqueous case and found five different patterns for both aligned and off-centered bedforms. We proposed maps of patterns that depend on the ratio between the number of grains of each dune, Shields number and bedform alignment. We now investigate the barchan-barchan interactions at the grain scale. For that, experiments were conducted in a water channel of transparent material where controlled grains were poured inside, forming pairs of granular piles in both aligned and off-centered configurations. A high-speed camera placed above the channel acquired images of the bedforms, and with image processing we tracked several of the moving grains. We obtained the exchange of grains between barchans (including barchan-barchan collisions). The present results are crucial to understand how different patterns emerge from barchan-barchan interactions.

<sup>1</sup>W. R. Assis is grateful to FAPESP (grant no. 2019/10239-7) and E. M. Franklin to FAPESP (grant no. 2018/14981-7) and to CNPq (grant no. 400284/2016-2) for the financial support provided.

Willian Assis  
School of Mechanical Engineering, University of Campinas (UNICAMP)

Date submitted: 16 Jul 2020

Electronic form version 1.4