

Abstract Submitted  
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**Stability of isolated Barchan dunes** ANTOINE FOURRIÈRE,  
FRANÇOIS CHARRU, IMFT, Université de Toulouse, 31400 Toulouse — When sand grains are entrained by an air flow over a non-erodible ground, or with limited sediment supply from the bed, they form isolated dunes showing a remarkable crescentic shape with horns pointing downstream. These dunes, known as Barchan dunes, are commonly observed in deserts, with height of a few meters and velocity of a few meters per year (Bagnold 1941). These dunes also exist under water, at a much smaller, centimetric size (Franklin & Charru 2010). Their striking stability properties are not well understood yet. Two phenomena are likely to be involved in this stability: (i) relaxation effects of the sand flux which increases from the dune foot up to the crest, related to grain inertia or deposition, and (ii) a small transverse sand flux due to slope effects and the divergence of the streamlines of the fluid flow. We reproduced aqueous Barchan dunes in a channel, and studied their geometrical and dynamic properties (in particular their shape, velocity, minimum size, and rate of erosion). Using coloured glass beads (see the figure), we were then able to measure the particle flux over the whole dune surface. We will discuss the stability of these dunes in the light of our measurements.

François Charru  
IMFT, Université de Toulouse, 31400 Toulouse

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