Reply to Andreotti: Consistent saltation height measurements and physical assumptions

In response to the comments of Andreotti (1), first, we do not maximize the flux; instead we calculate the saturated sand flux (2). Thus, no "criterion" is adopted, because the value of sand flux is a result of the calculations and not an assumption. Second, the statement that our model ignores the ability of the transported grains to eject other grains ("splash") is false. The simulations do account for the splash; however, it is well known that in the saturation regime each grain–bed collision results in one ejected grain—as in the simulations (2). Furthermore, of course one has a complex splash function giving the probability into which directions grains are ejected with which velocity (3). But putting that function in any calculation would make the calculation impossible. This function is known only empirically and with low precision, and thus, in practice, such kinds of simulations would be neither useful nor possible.

The last point raised by Andreotti (1) is wrong: That the trajectories on Mars are much higher than on Earth has also been shown before by White (4). It is true that our model does not agree with Andreotti's model, which is based on the assumption that the grains of Mars dunes have diameters <100 μm. If the grains were so small, dunes would not be stable under the observed Mars sand storms.

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