

Abstract Submitted
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Lift and drag forces in washboard road NICOLAS TABERLET, BAPTISTE PERCIER, SEBASTIEN MANNEVILLE, ENS Lyon, JIM MCELWAIN, University of Cambridge, STEPHEN MORRIS, University of Toronto — When a wheel of plow is dragged at a constant velocity on a granular bed, a ripple pattern known as washboard road forms if the velocity is above a critical value. Although much work has been recently devoted to this topic the underlying mechanisms remain unclear. We have studied the phenomenon using both an experimental setup consisting of a circular track on which a wheel or plow is dragged and 2D DEM simulations. Here we focus on the lift and drag forces exerted by the sand onto the wheel or plow. We found that these forces do not seem to depend on the velocity. We also found a linear relation between the lift and drag forces. These results are typical of static friction which is somewhat surprising considering the complexity of the granular flow advected by the wheel of plow. These results are a first step to the development of a stability analysis of washboard roads.

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