

Abstract Submitted
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Force measurements after granular impact using instrumented spheres SYLVAIN JOUBAUD, Laboratoire de Physique - ENS de Lyon, TESS HOMAN, Physics of Fluids, University of Twente, YOANN GASTEUIL, Laboratoire de Physique - ENS de Lyon, DETLEF LOHSE, DEVARAJ VAN DER MEER, Physics of Fluids, University of Twente — Impacts of solid spheres on soft and dry sand may result in the rapid sinking of the sphere into the sand. This in turn can lead to a jet shooting up from the surface of the sand. The dynamics of the sphere is affected by the impact velocity and the ambient air pressure. In this work, we performed direct measurement of the acceleration using instrumented spheres from *SmartINST*. These spheres non-invasively and continuously transmit the force acting on themselves as they penetrate into the sand using a radio signal, *i.e.*, without disturbing the behavior of the granular medium which any invasive measurement technique would do. The signal reveals very complex dynamics including a signature of the jet formation. These results are compared to various phenomenological models.

Sylvain Joubaud
Laboratoire de Physique - ENS de Lyon

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