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**Granular Jets: The Surprising Role of Air Pressure**[1] JOHN ROYER, ANDREW FLIOR, ERIC CORWIN, HEINRICH JAEGER, The James Frank Institute, The University of Chicago — We report on the symmetric, focused jet formed by a solid sphere impacting a loosely packed, dry granular powder. Similar jets have been observed in liquids and studied in detail. However, it is surprising that such a jet can form in sand, where there is little to no attractive potential between the individual particles and no surface tension. A model of the jet formation has been proposed [2] [3] in which the jet is the result of the uniform collapse of the void left by the impacting sphere due to 'hydrostatic' pressure. Experimentally, we find that there is a very strong *air* pressure dependance in the dynamics of the jet. Instead of a single jet, we observe two jets: a small, thin jet that is not strongly affected by the air pressure followed by a second jet whose size and velocity depend strongly on the air pressure. This air pressure dependance indicates that hydrostatic models based solely on void collapse may not completely capture nature of the phenomena.

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[2]S. Thoroddsen and A. Q. Shen. Phys. Fluids **13**, 4 (1996).
[3]D. Lohse et. al., Phys. Rev. Lett. **93**, 198003 (2004).

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