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**Fingering Instabilities in a Granular Hele-Shaw Cell** XIANG CHENG, AARON PATTERSON, LEI XU, HEINRICH JAEGER, SIDNEY NAGEL, The James Franck Institute and Department of Physics, The University of Chicago — In many respects, dry granular material can be thought of as a fluid with no surface tension. We have used this “liquid” to study the fingering instability that occurs in a Hele-Shaw cell in which air entering at the center of a 2-dimensional cell displaces the surrounding dry granular material which is held between two closely spaced glass plates. This provides a situation in which one can study fingering in the limit of zero surface tension. We have systematically studied the fractal dimension of the fingering pattern during the growth process. The final pattern that we observe has a shape with a fractal dimension close to 1.7. We also study the dependence of the fingers on the flux rate, size of grains and size of gap between the glass plates. The mechanisms for the instabilities are investigated.

Xiang Cheng  
The James Franck Institute and Department of Physics  
The University of Chicago

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