

Abstract Submitted
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Density-wave fronts on the brink of wet granular condensation¹

KAI HUANG, ANDREAS ZIPPELIUS, Experimentalphysik V, University of Bayreuth, 95440 Bayreuth, Germany, SAND LAB @ UNIVERSITY OF BAYREUTH TEAM — From sand dunes to Faraday heaping, driven granular matter, i.e., large agglomeration of macroscopic particles, is rich pattern forming system. When a granular material is partially wet (e.g., wet sand on the beach), a different pattern forming scenario arises due to the cohesive particle-particle interactions. Here, we focus on the formation of density-wave fronts in an oscillated wet granular layer undergoing a gas-liquid-like transition ². The threshold of the instability is governed by the amplitude of the vertical vibrations. Fronts, which are curved into a spiral shape, propagate coherently along the circular rim of the container with leading edges. They are stable beyond a critical distance from the container center. Based on the measurement of the critical distance and the rotation frequency, we propose a model for the pattern formation by considering the competition between the time scale for the collapse of cohesive particles and that of the energy injection resisting this process.

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²A. Zippelius and K. Huang, **Sci. Rep.** 7, 3613

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