

Abstract Submitted  
for the DFD15 Meeting of  
The American Physical Society

**Pattern formation in triboelectrically charged binary packings**

ANDRE SCHELLA, Max Planck Institute for Dynamics and Self-Organization Göttingen, Am Fassberg 17, 37077 Göttingen, Germany, THOMAS VINCENT, ESPCI Paritec, 10 rue Vauquelin, 75231 Paris Cedex 05, France, STEPHAN HERMINGHAUS, Max Planck Institute for Dynamics and Self-Organization Göttingen, Am Fassberg 17, 37077 Göttingen, Germany, MATTHIAS SCHRÖTER, Institute for Multiscale Simulations, Nägelsbachstrasse 49b, 91052 Erlangen, Germany — Electrostatic self-assembly is an interesting route to aim at creating well-defined microstructures [1]. In this spirit, we study the process of self-assembling for vertically shaken granular materials. Our system consists from 1 to 400 plastic beads of 3mm size made from Teflon and Nylon in 2D and 3D geometries. We find self-organization in four, five and sixfold order which is due to charging of the system via triboelectric effects between the grains. We observe that the binary system solidifies on a time scale of a few minutes. Image processing is used to extract the structural and dynamical properties of the assemblies. The mixture ratio is tuned from 1:5 to 5:1 and the humidity level is varied between 10% and 90% leading to various transitions between the morphologies.

[1] B. Grzybowski et al. , Nat. Materials 2, 241-245 (2003)

Andre Schella  
Max Planck Institute for Dynamics and Self-Organization Göttingen,  
Am Fassberg 17, 37077 Göttingen, Germany

Date submitted: 28 Jul 2015

Electronic form version 1.4