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Tracking single particles motion in shaken wet powder clusters JENNIFER WENZL, National Superconducting Cyclotron Laboratory, MSU, GUENTER K. AUERNHAMMER, LAURENT GILSON, Max-Planck Institute for Polymer Research, Mainz — In many industrial branches wet granulate powders, where the particles are connected via an additional binding liquid, are widely used. Amply investigated were model systems, where the binding liquid is homogeneously distributed, i.e. building a connecting capillary network. In contrast wet granulate model systems with an inhomogeneous liquid distribution have been rarely in focus of research. In this work a model system for wet powders was developed, which is suitable for 3D imaging with confocal microscopy. Fluorescent silica particles were immersed in a mixture of two immiscible liquids, one continuous and one binding liquid. In detail a wet powder cluster, where the binding liquid formed droplets was studied in 3D. During applying a mechanical load the motion of the powder particles and the binding liquid droplets was followed. Deformation of the binding liquid droplets led to an increase of its surface area and energy. When the droplet relaxed to an energetically more favored shape upon further cluster deformation, the sudden release of the stored surface energy led to complex powder particle and droplet motions. The model system illustrated the complex dynamics upon shaking, and showed that the binding liquid dominated the cluster dynamics on a local scale.

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