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Structure of granular clusters formed by capillary aggregation analyzed with Voronoi diagrams MICHAEL BERHANU, ARSHAD KUDROLLI, Department of Physics, Clark University, Worcester, MA 01610 — We investigate the spatial structure of particle aggregates floating at an air-liquid interface as a model system to understand heterogeneity of cohesive granular matter. The meniscus around identical floating particles introduces short range capillary attraction between the particles. In our experimental system, we increase slowly and continuously the particle number density to observe significant structural transformations. After imaging and tracking all the particles, the structure is characterized quantitatively by using Voronoi diagrams which allow us to elucidate small and large scale properties. We show that the system is organized by attraction for low and intermediate densities, which creates a short range order and gives it heterogeneity with pores of various sizes. As the free pore space are filled at high density, the role of attraction becomes less important compared with steric effects and aggregates show characteristics similar to non-cohesive granular media. Mechanical properties of aggregates will be also discussed in light of jamming transition for attractive athermal particles.

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