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Mean-field approach for random close packings of non-spherical and adhesive particles ADRIAN BAULE, School of Mathematical Sciences, Queen Mary University of London, ROMAIN MARI, Levich Institute, City College of New York, LIN BO, LOUIS PORTAL, Levich Institute and Physics Department, City College of New York, WENWEI LIU, SHUIQING LI, Department of Thermal Engineering, Tsinghua University, HERNAN MAKSE, Levich Institute and Physics Department, City College of New York — Random packings of objects of a particular shape are ubiquitous in science and engineering. However, such jammed matter states have eluded any systematic theoretical treatment due to the strong positional and orientational correlations involved. Here, a mean field theory based on a statistical treatment of the Voronoi volume is presented, which allows for the calculation of the random close packing of spherical as well as non-spherical hard particles. The extension of the framework to packings of adhesive particles is discussed. A phase diagram is presented that describes non-spherical and adhesive particles in terms of analytic continuations from the spherical random close packing.

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