**Cavity method for jammed disordered packings of hard particles
at mean-field level** LIN BO, The City College of New York & The Graduate Center, CUNY, ROMAIN MARI, The City College of New York, CHAOMING SONG, Northeastern University, HERNAN MAKSE, The City College of New York, SOFT MATTER AND COMPLEX SYSTEMS LAB TEAM — We apply the cavity method at mean-field level to investigate the problem of random close packings of hard particles. We derive the Belief Propagation equations describing this force/torque balance problem to solve the force distribution and suggest an estimation of the coordination number of the jammed packing. We compare the numerical results with approximate analytical solutions and show the dependence of coordination numbers on particle shapes. The method can be applied to spherical frictionless and frictional particles as well as non-spherical particles to obtain the jamming properties and study the appearance of isostaticity.

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