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Cavity method for Edwards ensemble of jammed matter HERNAN MAKSE, LIN BO, YULIANG JIN, the City College of New York, CHAOMING SONG, Northeastern University, SOFT MATTER AND COMPLEX SYSTEMS LAB TEAM — Two theoretical frameworks have emerged to investigate the problem of random close packings: the Edwards statistical mechanics and the cavity method for glassy systems. Here we propose a model that combines both approaches into a single Hamiltonian imposing force balance constraints and minimization of the volume of the system. The formalism can be put into the framework of constraint optimization problems as recently proposed. The cavity method then solves the problem of force balance providing a prediction of the coordination number of the jammed packing. The model can be applied to spherical frictionless and frictional particles as well as non-spherical particles providing a prediction of the coordination number as a function of the aspect ratio of the particles.

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