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Pinning Susceptibility Near the Jamming Transition[1] SAMER NASHED, AMY GRAVES, Swarthmore College, CARL GOODRICH, University of Pennsylvania, ELLIOT PADGETT, Cornell University, ANDREA LIU, University of Pennsylvania — The study of jamming in the presence of pinned obstacles is of both practical and theoretical interest. In simulations of soft, bidisperse disks and spheres, we pin a small fraction, n_f of particles prior to the equilibration process. The presence of pinned particles is known to lower the critical packing fraction, ϕ_J, for jamming. Further, around this threshold there is a peak in a quantity which we have termed the "pinning susceptibility": $\chi_P = \lim_{n_f \to 0} \frac{\partial P_J(\phi, n_f)}{\partial n_f}$. In the thermodynamic limit, we have posited that $\chi_P \propto |\Delta\phi|^{-\gamma_P}$. Finite-size scaling calculations, involving careful fits of P_J to logistic sigmoidal functions, yield a value for the critical exponent, γ_P. This new exponent is proposed to be independent of inter-particle potential. Its dependence on dimensionality (2 vs. 3 dimensions) will be discussed.

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