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Jamming vs Caging in Three Dimensional Jamming Percolation YAIR SHOKEF, NIMROD SEGALL, EIAL TEOMY, Tel Aviv University — We study a three-dimensional kinetically-constrained lattice-gas model [1], in which the ability of a particle to move depends on the occupation of neighboring sites in an orientational manner. The kinetic rules are constructed such that chains of permanently-frozen particles reach an infinite length at the critical density of directed percolation. Thus at this critical density the system undergoes a jamming transition, above which there is a finite fraction of jammed particles. We demonstrate that the three-dimensional mesh-like structure of the one-dimensional jammed chains enables the free particles to propagate through the holes in this mesh. This diffusive motion is terminated at a second critical density above which all particles are caged. The largest and second largest clusters of dynamically-connected sites exhibit singularities at both densities. Thus our model assists in separating between the two distinct phenomena of jamming and caging. [1] A. Ghosh, E. Teomy and Y. Shokef, Europhys. Lett. 106, 16003 (2014).

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