Geometric Signatures of Jamming in the Mechanical Vacuum: Supplemental Figures

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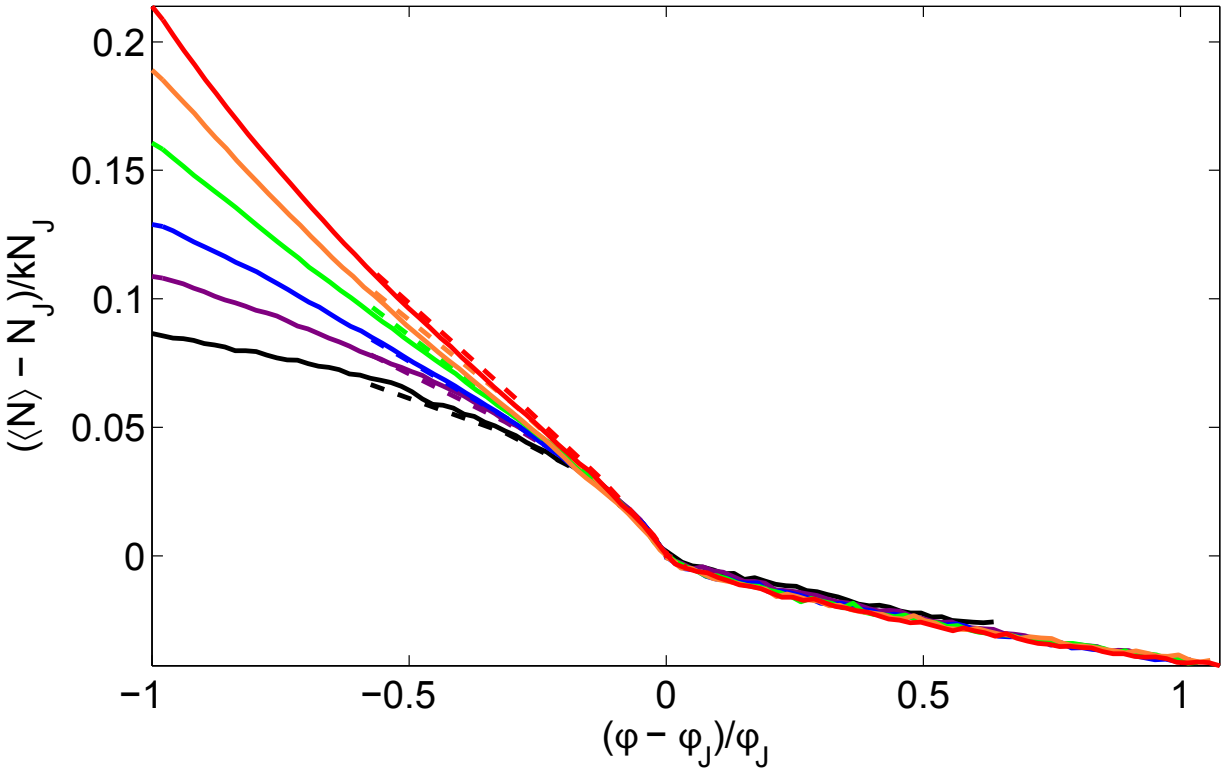

FIG. 1. Scaled mean number of neighbors vs. scaled packing fraction for various packing protocols. Solid lines represent Infinite Quench data and dashed lines represent Geometric Mean search data. The same values for ϕ_J, N_J, and k are used for collapse in each dimension. In general it is not required that we use the same parameters, but we have done so to show how strong the agreement is between the methods used to approach jamming. Shown are d= 3 (black), 4 (purple), 5 (blue), 6 (green), 7 (orange), 8 (red).

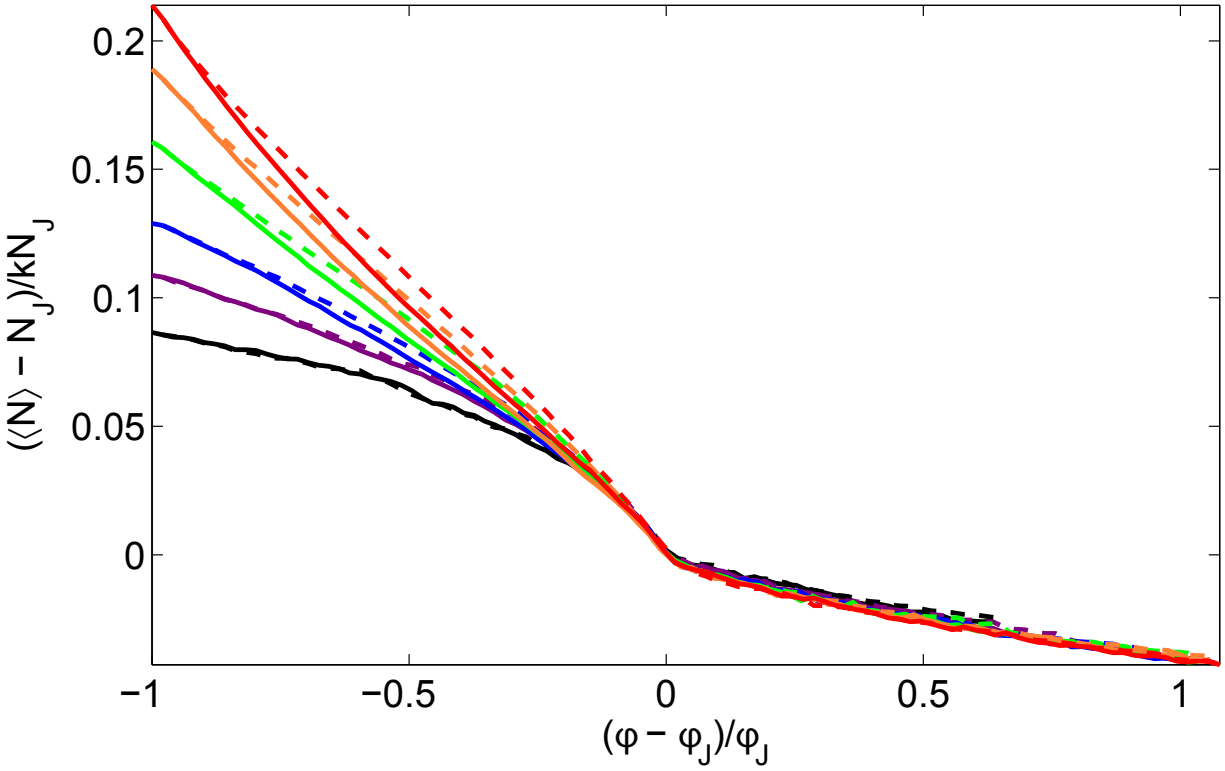

FIG. 2. Scaled mean number of neighbors vs. scaled packing fraction for various packing protocols. Solid lines represent Infinite Quench data and dashed lines represent a simulated annealing wherein each point represents a dilation from the previous data point followed by an energy relaxation. The same values for ϕ_J, N_J, and k are used for collapse in each dimension. In general it is not required that we use the same parameters, but we have done so to show how strong the agreement is between the methods used to approach jamming. Shown are d= 3 (black), 4 (purple), 5 (blue), 6 (green), 7 (orange), 8 (red).

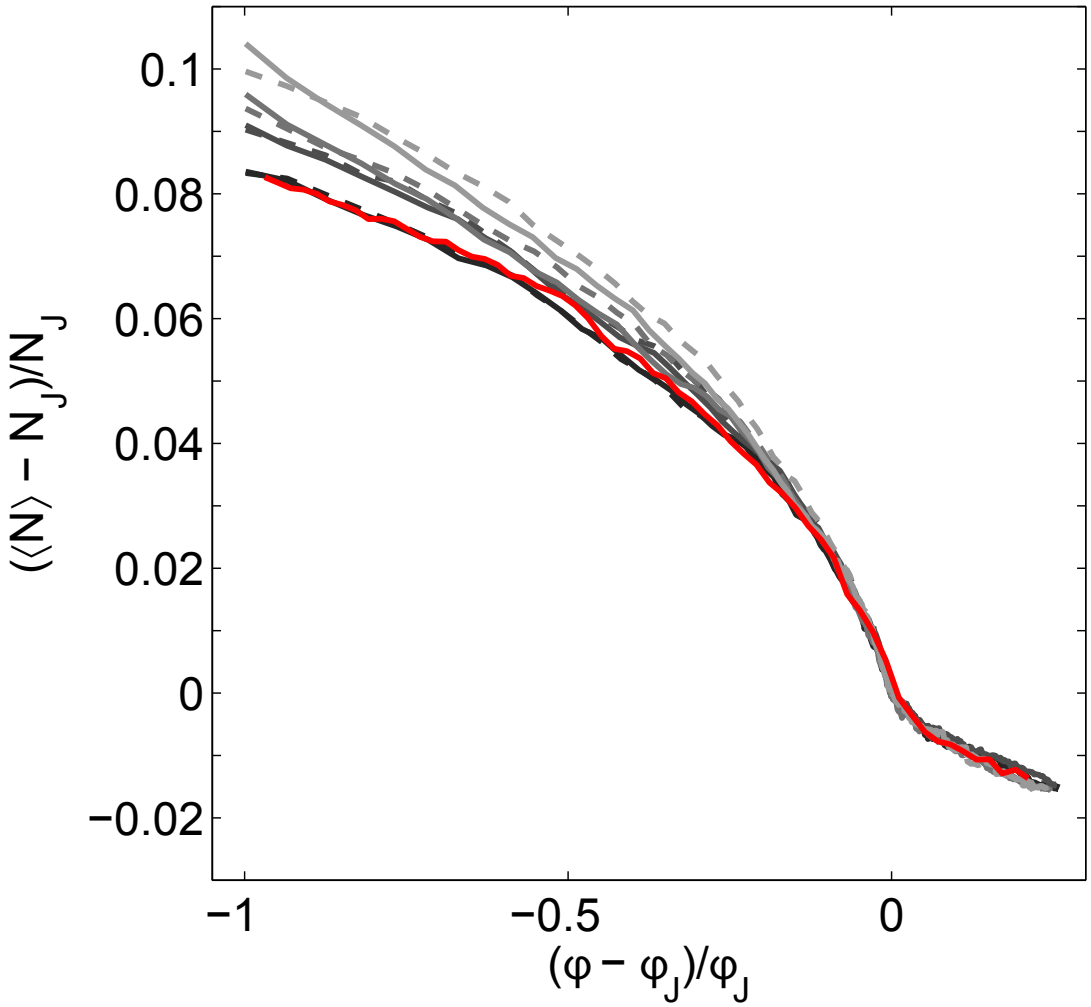

FIG. 3. Scaled mean number of neighbors vs. scaled packing fraction for various neighbor definitions with polydisperse data in $d = 3$. Solid lines represent Additively Weighted Voronoi, and dashed lines represent Radical Voronoi (also called the Laguerre tessellation). Behavior at the phase transition is robust against neighbor definitions. As in Figure 2b, values of the order of the potential α range from 1.5 (black) to 4 (light gray) with the Hookean potential ($\alpha = 2$) shown in red.

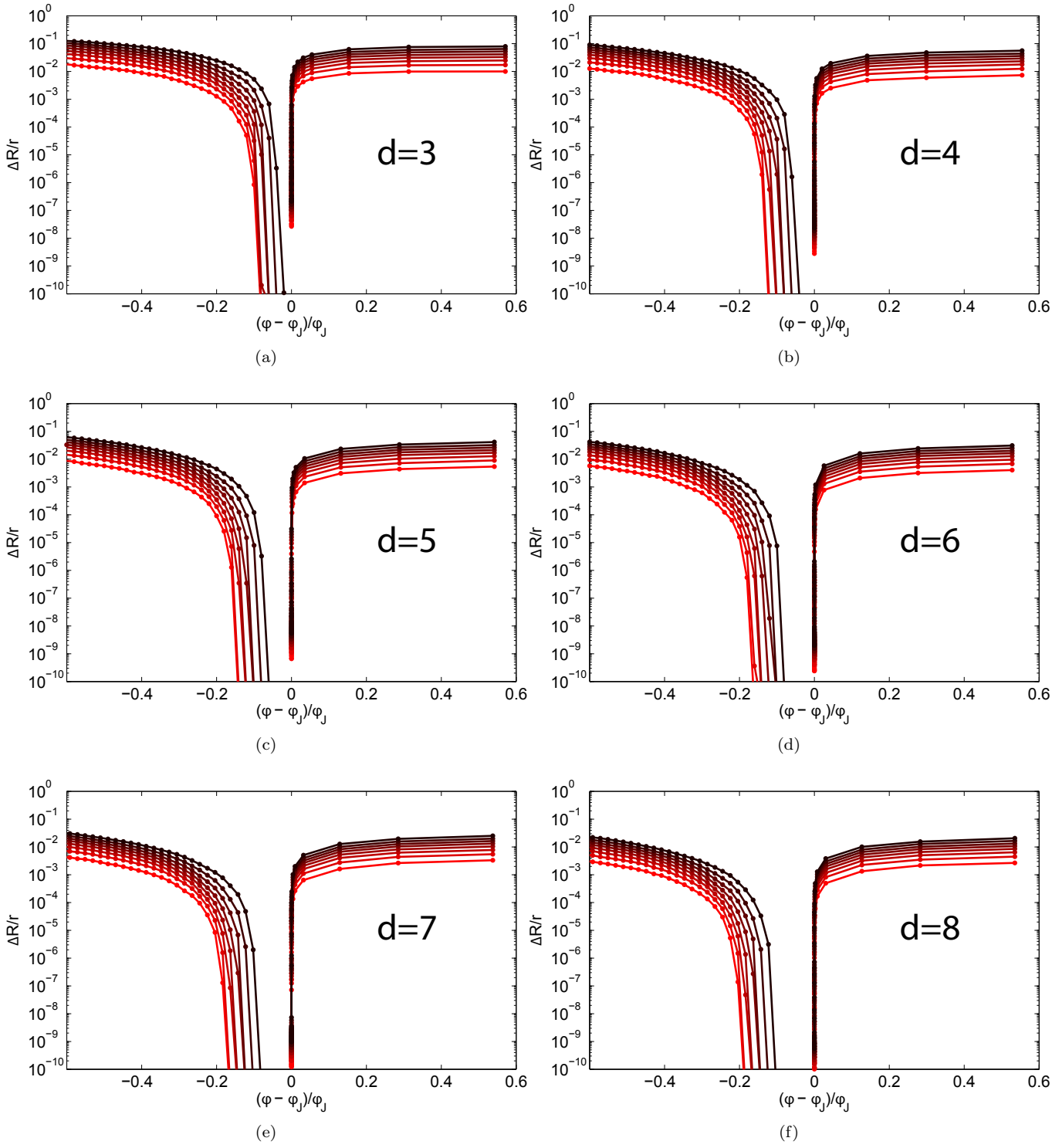

FIG. 4. Width of the distribution of Maximum Inscribed Spheres calculated from the middle 15% (red) to 85% (black) of the distribution in steps of 10%. A width of 80% is used in the text. Note that each definition corresponds to a slightly different ϕ^*, but that the general trend of ϕ^* with dimension is robust. The packings analyzed are the same as seen in Figure 3b in the paper. The packings above ϕ_J are made using a Geometric Mean search and the packings from below are made via Infinite Quench.

Dim	ϕ^*	ϕ_J below	ϕ_J above
3	0.6150	0.6372	0.6472
4	0.4270	0.4517	0.4636
5	0.2820	0.3031	0.3155
6	0.1792	0.1965	0.2066
7	0.1115	0.1238	0.1309
8	0.0672	0.0758	0.0809

FIG. 5. Table of values for ϕ^*, and ϕ_J used in this manuscript. Note that there are a range of values for the jamming transition dependent on method.