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Jamming in Disordered and Ordered States: From RLP to FCC[1]

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The concept of jamming was originally introduced in the context of zero-temperature, frictionless sphere packings through which the jamming transition was identified with the more familiar idea of random close packing. More recently, the jamming behaviour for particles with friction has led to a practical definition of the less well-defined random loose packed limit. However, there are a number of subtleties associated with jamming that extend these concepts further. Here we implement a range of protocols to generate jammed packings both with and without friction, and find that the jamming transition actually consists of a finite region in packing fraction depending on the protocol used to create the jammed state. Furthermore, we examine how it is possible to tune the structural properties of jammed packings from the disordered regime through to the ordered face centred cubic lattice, and the subsequent changes in the jamming properties as the structure is manipulated.

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