

Random sequential adsorption of cubes

Study of properties of hard objects random packings provide insight into a structure of granular media, soft- and bio-matter as well as heterogeneous or composite materials. Numerical modeling of such packing, reveals rules responsible for different processes occurring in them like for example self-assembly of nanoparticles or glass formation, etc.

One approach to random packings uses random sequential adsorption (RSA) algorithm, which is based upon iterations of the following steps:

- a virtual particle is created. Its position and orientation inside a packing are selected randomly.
- the virtual particle is tested for overlaps with any of the other, previously placed, particles. If no overlap is found, it is placed, holding its position and orientation until the end of simulations. Otherwise, the virtual particle is removed and abandoned.

The packing is called saturated or jammed when no more particles can be added to it.

In this study we focus on three dimensional random packings built of unoriented cubes. Previous works considering two-dimensional random packings of unoriented squares provided, among others, unexpected information about kinetics of RSA.

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