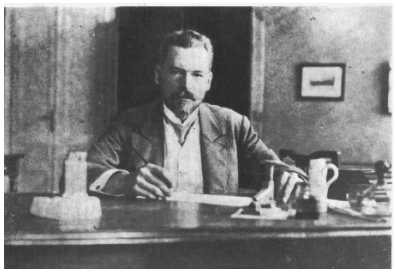

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Random Sequential Adsorption of Platonic and Archimedean Solids

Tuesday, 4 September 2018 12:05 (20 minutes)

Packings of objects attracted people's interest for many centuries. For example, during colonial era packings of spheres were studied to find the most optimal way to transport cannonballs. Today, densest packings are utilized in a variety of areas starting from condensed matter physics where they can model crystalline structures, and ending with telecommunication where they indicate how to optimize transfer rates. Besides densest random packing, a lot of attention is focused on random packings as they can model granular matter and biological objects. One of the easiest protocols used to obtain such packings, is random sequential adsorption (RSA): particles of random position and orientation are added to the packing one after the other if they do not overlap with any of previously placed objects. This study focuses on RSA packings build of identical Platonic and Archimedean solids. Besides finding a mean packing fraction, they are analyzed in terms of kinetics of packing growth as well as propagation of translational and orientational order. Moreover, an effective intersection test for those objects is provided.

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