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Voronoi cell sizes distribution of two-dimensional granular packings and parking lot model KEVIN HERNANDEZ PARDO, LEONARDO REYES, Universidad Simon Bolivar — In 1989, Edwards and Oakeshott proposed a statistical mechanics description for granular packings in mechanical equilibrium. In this approach, the volume of the bulk plays the role of the energy in thermal systems and an analogous of the temperature, called compactivity, arises. In 2007, Aste *et al.* found a gamma distribution of Voronoi cell-sizes in granular packings which seems independent of preparation and history of the system. The parking lot model (PLM) is a stochastic system in which particles are thrown over a line at random continuous positions. Particles can be adsorbed with a rate p_+ plus a volume exclusion principle, and particles in the line can be desorbed with a rate p_- . Other than desorption, particles cannot move within the line. It is known that after a transient the system fluctuates around a density which depends only on the parameter $K = p_+/p_-$. Nowak *et al.* introduced this model in the context of granular materials in 1998. Tarjus and Viot studied the PLM in the context of the statistical mechanics proposed by Edwards. We have found that, for high densities, the distribution of Voronoi cell lengths in the one-dimensional PLM is also a gamma distribution. In this work we compare the distribution of local Voronoi cell sizes of molecular dynamics simulations of soft discs in two dimensions and Monte Carlo simulations of the two-dimensional PLM.

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