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How does friction affect the distribution of mechanically stable disk packings?[1] ERIK BROWN, Department of Physics, Yale University, GUO-JIE GAO, JERZY BLAWZDZIEWICZ, Department of Mechanical Engineering, Yale University, COREY O'HERN, Departments of Mechanical Engineering and Physics, Yale University — In recent work (*Physical Review E* **71** (2005) 061306), we generated nearly all of the mechanically stable packings in small systems composed of up to 20 bidisperse frictionless disks that interact via normal forces. Complete enumeration allowed us to decompose the probability distribution $P(\phi)$, for obtaining a mechanically stable state at packing fraction ϕ into algorithm-dependent and independent contributions, $\beta(\phi)$ and $\rho(\phi)$. $\rho(\phi)$ is the probability density to obtain a distinct mechanically stable packing at ϕ, while $\beta(\phi)$ is the frequency with which each distinct state occurs. In the present study, we add frictional interactions between grains that vanish when the particles are rest. We will compare distributions of mechanically stable packings in systems with and without friction. In particular, we will comment on whether a well-defined random loose-packed state exists in 2D.

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