The Statistical Mechanics of Small Packings S.S. ASHWIN, JERZY BLAWZDZIEWICZ, COREY O'HERN, Department of Mechanical Engineering and Department of Physics, Yale University, MARK SHATTUCK, Benjamin Levich Institute and Physics Department, City College of the City University of New York — We explore the statistical mechanics of mechanically stable (MS) packings composed of six or more monodisperse hard discs confined within a unit box. This system has the advantage that all MS packings can be enumerated, yet it has a topologically nontrivial density landscape in contrast to systems with fewer than six disks. We compare the packing probabilities obtained using discrete particle simulations to those obtained using master equation approaches, which relate entropic bottlenecks to transition probabilities. We determine how the MS packing probabilities vary with the packing protocol, and in particular, the extent to which the Edwards' equal-probability assumption is violated.

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