

COMPUTING VOLUMES OF CONVEX BODIES

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A longstanding challenging algorithmic problem has been that of computing the (approximate) volume of a convex body. In the mid-nineties, Dyer, Frieze and Kannan introduced an MCMC algorithm to approximate the volume of a convex body, which was shown to run in randomised polynomial time. In this work, we show how the volume computation problem for a certain class of polyhedral convex bodies is related to the so-called hard-core model that arises in statistical physics. We show that the hard-core model with Lebesgue measure displays no phase transitions and discuss its algorithmic implications.