Strongly Interacting Classical Particles in Confined Geometry : Ensemble Transformations

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Master thesis in Physics

We study the relations between the micro-canonical, canonical and grand-canonical ensembles, and investigate the mathematical and numerical methods allowing to transform between them. Our main subject of interest is the Percus functional for the hard-rod potential, which is a rare example of an exact functional. After a brief introduction to the subject, we start by numerically calculating the grand-canonical partition function and then proceed to transform "downwards", first to the canonical and then to the micro-canonical ensembles, using various analytical and numerical methods.

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