Small Systems in the Microcanonical, Canonical and Gibbs Ensembles

Jonathan Monteverde

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We investigate the differences and the relations between the canonical and the microcanonical ensembles for a small ideal gas and a small weakly repulsive system with the gravitational and harmonic potentials as examples. Starting from the canonical ensemble, we then construct the Gibbs ensemble for a small ideal gas system in a harmonic potential.

Prof. Joseph Brader