Thermodynamics of a time-dependent and dissipative oval billiard: A heat transfer and billiard approach

Abstract
We study some statistical properties for the behavior of the average squared velocity—hence the temperature—for an ensemble of classical particles moving in a billiard whose boundary is time dependent. We assume the collisions of the particles with the boundary of the billiard are inelastic, leading the average squared velocity to reach a steady-state dynamics for large enough time. The description of the stationary state is made by using two different approaches: (i) heat transfer motivated by the Fourier law and (ii) billiard dynamics using either numerical simulations and theoretical description. (AU)