

# Homogenization of the linear Boltzmann equation in a periodic system of holes

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Abstract

This talk reviews recent results obtained in collaboration with E. Bernard and E. Caglioti on the homogenization problem for the linear Boltzmann equation for a monokinetic population of particles set in a periodically perforated domain, assuming that particles are absorbed by the holes. We distinguish a critical size for the hole radius in terms of the distance between neighboring holes, derive the homogenized equation under this scaling assumption, and study the asymptotic mass loss rate in the long time limit. The homogenized equation so obtained is set on an extended phase space as it involves an extra time variable, which is the time since the last jump in the stochastic process driving the linear Boltzmann equation. The asymptotic decay of the mass follows from elementary arguments in renewal theory.