

Regularity for diffuse reflection boundary problem to the stationary linearized Boltzmann equation in a convex domain

I-Kun Chen*; Chun-Hsiung Hsia; Daisuke Kawagoe

National Taiwan University
E-mail: ikunchen@ntu.edu.tw

Abstract

We investigate the regularity for the diffuse reflection boundary problem to the stationary linearized Boltzmann equation for hard sphere potential, cutoff hard potential, or cutoff Maxwellian molecular gases in a strictly convex bounded domain. We obtain pointwise estimates for first derivatives of the solution provided the boundary temperature is bounded differentiable and the solution is bounded. The key idea is to transfer the regularity in velocity variables obtain by collision and diffuse reflection to space variables by the combination of free transfer and averaging through proper choice of coordinates.