Group Classification and Representations of Invariant Solutions of the full Boltzmann Equation

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Abstract. Group analysis developed especially for differential equations allows systematic study of solutions of the full Boltzmann kinetic equation. The study is connected with the admitted Lie group of infinitesimal transformations. Group classification of admitted group gives all representations of essentially different invariant solutions. Usually the group classification is quite difficult to do: it requires the application of special methods developed in group analysis. The lucky fact for the Boltzmann equation is that this equation and the system of gas dynamics equations admit isomorphic Lie groups. It allows using results of the group classification obtained for the gas dynamics equations.

In this report the representations of all invariant solutions of the full Boltzmann equation and its Fourier representation when they are reduced to the equations with one or two independent variables were constructed.

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