

# Principle of Mass Conservation for the Boltzmann's Moment System of Equations in Fourth Approximation

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**Abstract:** We study the one-dimensional non-linear non-stationary Boltzmann's moment system of equations in fourth approximation with the tools developed by Sakabekov in [1-2]. For the third approximation Sakabekov proves the mass conservation law (cf. Theorem in [2]). We consider the initial value problem for the system of hyperbolic partial differential equations in the conservative form. We extend the proof of the principle of mass conservation to the fourth approximation. The principle of mass conservation allows to prove the global existence in time of the solution of the system of nine hyperbolic partial differential equations representing the fourth approximation of the one-dimensional non-linear nonstationary Boltzmann's moment system of equations.

**Keywords:** Boltzmann equation, moment system, mass conservation, initial value problem, hyperbolic partial differential equations

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