Relativistic viscosity coefficient in strongly collisional plasmas

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Abstract

The linear transport theory for relativistic plasmas with finite collisionality is presented. The analysis reported in Ref. 1 restricted to the first plasma anisotropy was extended taking into account the second anisotropy corresponding to the stress tensor. The electron Fokker-Planck equation was numerically solved for perturbed plasmas with respect to the global equilibrium defined par the Maxwell-Boltzmann-Jüttner distribution function. The collisions include both electron-electron and electron-ion contributions, and the differential form [2] of Baliev-Budker collision operators [3] was used. To solve the integro-differential Fokker-Planck equation the electron distribution function was expanded on the spherical harmonic basis. In addition the analytic expression of the viscosity coefficients were also derived in the high Z-limit, where Z is the ion charge number.

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