Momentum Distribution in Astrophysical Plasmas

P.Quarati
Dipartimento di Fisica- Politecnico Torino and INFN Sezione di Cagliari

F.Ferro
Dipartimento di Fisica- Politecnico di Torino and INFN Sezione di Torino

When random forces and/or ion correletions are present , microscopic dynamics of ion collisions and quantum effects can modify the momentum distribution of ions and electrons in stellar and other astrophysical systems.
A few microscopic interactions among the particles, significant in very specific interval of energy , lead to peculiar corrections to the equilibrium Maxwell-Boltzmann distribution.
All these modifications can be taken into account by using the non-extensive statistical mechanics.
Consequences on the resonant and non-resonant fusion rates and atomic processes are remarkable and may affect astrophysical atomic and nuclear rates. Few examples are reported.