International Conference

Strongly Coupled Coulomb Systems

30 July – 4 August 2017, Kiel

Keynote Speakers

Gordon Baym (Illinois, USA)
Siegfried H. Glenzer (Stanford, USA)
Stefan Kuhr (Strathclyde, UK)
Stephane Mazevet (Paris, France)
Carlo Pierleoni (L'Acquila, Italy)
Andrea Tomadin (Genoa, Italy)

Invited Speakers

Bernard Bernu (Paris, France)
Ben van Duppen (Antwerp, Belgium)
Tobias Dornheim (Kiel, Germany)
Yan Feng (Soochow, China)
V.E. Fortov (Moscow, Russia)
Martin French (Rostock, Germany)
Fabian Heirich-Meisner (Munich, Germany)
Y.E. Lozovik (Moscow, Russia)
Manoel Manghi (Toulouse, France)
Andrea Perali (Camerino, Italy)
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Electrical conductivity of dense semiclassical plasma

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During the last few years many papers about the transport properties of dense plasmas have been published. The electrical conductivity in fully ionized hydrogen plasma is well investigated [1-3]. Besides hydrogen, noble gases are widely studied in plasma physics because of their simple electronic structure as closed shell systems. Especially, the electrical conductivity is of interest: Various experiments were performed measuring the electrical conductivity of helium [4, 5, 6], neon [4, 7], argon [4, 6, 7], krypton [4, 8], and xenon [4, 6, 7, 9].

In this paper we will consider fully ionized hydrogen plasma, that means with temperatures between lot 10^4 K and 10^7 and densities up to the pressure ionization limit. In the fully ionized plasma state the electrical conductivity is determined only by the scattering of free electrons (e) and protons (p). Therefore we have to take into account the formation, the decay and the scattering of bound states in two, particle collisions.

Based on the effective potential [10] the transport properties of the plasma particles were investigated. Quantum mechanical method of phase functions and Born approximation were used for their calculation. The results are compared with data of other theoretical and experimental.

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