15th International Conference on the Physics of Non-Ideal Plasmas Almaty, August 30- September 4, 2015

Book of Abstracts

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Al-Farabi Kazakh National University

Institute of Experimental and Theoretical Physics

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Abstracts of talks

Wednesday 02.09.2015, 9:00 – 12:30

I5: Wednesday 02.09.2015, 9:00 - 9:40

Application of the method of moments in plasma physics: new developments

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The dielectric function of dense equilibrium two-component plasmas constructed within the classical method of moments [1] satisfies all convergent sum rules automatically. Since these sum rules are directly related to the coefficients of the (inverse) dielectric function asymptotic high-frequency expansion, the asymptotic properties of existing alternative models (the extended random-phase and Mermin approximations, the full-conserving model, etc.) are analyzed Some drawbacks and advantages of the above models with respect to the convergent sum rules are pointed out [2].

The influence of the electron-ion coupling in two-component target plasmas on the stopping power [3] and straggling properties of the latter, particularly their asymptotic forms corresponding to high projectile velocities, are studied within the moment approach and the above alternative models of the plasma dielectric function.

A model for the two-component plasma dynamic structure factor free of adjustment parameters is suggested and successfully tested [4] against the simulation data [5].

References

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