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

ICNP

Book of Abstracts

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

Al-Farabi Kazakh National University

Institute of Experimental and Theoretical Physics

National Laboratory of Nanotechnology

TNS-INTEC

Insitute of Applied Sciences and Information Technologies

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Laboratory of Engineering Profile

Nr.	Name	Surname	Title of Contribution
P1.1	Sebastien	Hamel	First-principles calculations of the high-pressure melting line of SiO2 and strenght of H2O: planetary science implications
P1.2	Ayatola	Gabdulin	MD Simulation of 2D System of Polarized Dust Particles
P1.3	Anatoly	Kupchishin	Cascade-Probability Method and Relationship with Markov Chains
P1.4	Alexandr	Larkin	Numerical Calculation of Thermodynamical Calculation of Thermodynamical Properties of Relativistic Particle in Potential Field
P1.5	Yaroslav	Lavrinenko	Boundary condition problem for atomistic simulations of classical and quantum strongly coupled systems of charged particles
P1.6	Péter	Magyar	Quadratic static response of the classical One-Component Plasma
P1.7	Alexey	Andreyev	Foundation of thermodynamics within the laws of the classical mechanics
P1.8	Yuriy	Arkhipov	Effective potentials in semiclassical two-component plasmas
P1.9	Asel	Ashikbayeva	Dynamic properties of Dirac plasmas in the random-phase approximation
P1.10	Alexander	Chigvintsev	Anomalous Phase Diagram in Simplest Plasma Model
P1.11	Yultuz	Omarbakiyeva	Cluster virial expansion of the equation of state for hydrogen plasma with e – H_2 contributions
P1.12	Jean-Christophe	Pain	Multi-configuration modeling of ionization potential depression in dense plasmas
P1.13	Aleksey	Shumikhin	The distinguishing features of the vapor-liquid (dielectric-metal) phase transition in metal vapors, semiconductors and rare gases
P1.14	Moldir	Issanova	Transport properties of inertial confinement fusion dense plasmas
P1.15	Nadine	Nettelmann	Warm Dense Hydrogen and Helium in Jupiter and Saturn: exploration of He sedimentation
P1.16	Nuriya	Bastykova	Controlled levitation of dust particles in rf+dc gas discharges
P1.17	Didar	Batryshev	Extraction of nano- and small dispersed microparticles in the plasma of radio-frequency discharge
P1.18	Lidia	Deputatova	Measurement of the charge of a single particle confined by the electrodynamic trap
P1.19	Merlan	Dosbolayev	The influence of the ionic composition of the plasma on dust structures in the combined discharge of radiofrequency and electrostatic fields
P1.20	Young-Dae	Jung	Nonthermal and geometric effects on the dual-mode surface waves in a Lorentzian dusty plasma slab
P1.21	Irina	Filatova	Plasma-assisted Functionalization of ZnO Nanoparticles and Production of Nanocrystalline ZnO Structures
P1.22	Alexey	Khrapak	Complex plasma research under microgravity conditions: PK-3 Plus laboratory on the International Space Station
P1.23	Ranna	Masheyeva	Effect of buffer gas induced friction on the cage correlation function of dust particles
P1.24	Vladimir	Messerle	Plasma for Fuel Processing
P1.25	Mukhit	Muratov	Influence of dipole interaction on the thermodynamic properties of dusty plasma

P1.14

Transport properties of inertial confinement fusion dense plasmas

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Studying of transport properties of the dense plasma is a great importance for plasma physics, as well as for the problems of inertial confinement fusion (ICF), warm dense matter driven by heavy ion beams [1]. Calculation of parameters of inertial fusion drivers $n_e > 10^{22}\,см^{-3}$ of heavy ion beams requires adequate quantitative description of the interaction of heavy ion beams with dense plasma in a wide range of parameters. Consequently, knowledge of transport properties in the plasma will enable us to calculate the design of thermonuclear target more accurately. These properties of plasma can be calculated accurately taking into account both quantum and collective effects in plasmas. One of the important values describing the transport coefficients of deuterium-tritium plasma is the Coulomb logarithm [2]. The Coulomb logarithm is obtained on the basis of effective potentials. These interaction potentials take into consideration long-range many particle screening effects as well as short-range quantum-mechanical effects [3]. For inertial confinement fusion applications, we have calculated deuterium thermal conductivity and electrical conductivity in a wide range of densities and temperatures. The results obtained for thermal conductivity and electrical conductivity are compared with the available experimental data [4] and the results of quantum molecular-dynamics simulation [5].

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