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Development of software package for the computer simulation of the dynamic properties of dense ICF plasmas

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Abstract :

At the present time the study of the dense ICF plasma properties is not only of fundamental interest, but it also has various important technological applications [1-2]. During design engineering of such plasma systems it is necessary to image complicated processes in dense plasma. In this connection the role of computer simulations equipped with visualization methods for analysis of processes in dense ICF plasma is increasingly important. Scientific visualization is becoming a key ingredient of research, development, and discoveries in numerous fields of science and technology. Scientific visualization systems help not only to represent the results of calculations, but also to integrate and analyze the results of calculations and experiments accumulated earlier [3]. In this work we present a software package based on modern information technologies that allows rapid analysis and visualization of the properties of dense plasmas. We calculate dynamic properties (stopping power, relaxation time, penetration depth) of plasma by using the Coulomb Logarithm on the basis of the effective potentials taking into account quantum diffraction and screening effects at short and large distances, respectively. The system for visualization is constructed on the basis of the OPEN-GL and 3D MaxStudio, C# platforms. 1. T. S. Ramazanov, S. K. Kodanova, M. K. Issanova, N. Kh. Bastykova, Zh. A. Moldabekov, Communications in Computational Phys., Vol. 15, 2014, pp. 981-995. 2. T. S. Ramazanov, S. K. Kodanova, Zh. A. Moldabekov, and M. K. Issanova. Phys. Plasmas 20, 112702 (2013). 3. S. K. Kodanova, T. S. Ramazanov, M. K. Issanova, G. N. Nigmatova, and Zh. A. Moldabekov. Contrib. Plasma Phys. 55, 2015, pp. 271-276.

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