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## Investigation of the entropy of a system of many particles with gravitational interaction

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This paper is devoted to the study of entropy of a system of many particles with gravitational interaction. The study of entropy behavior is based on the Vlasov kinetic equation, using both numerical and exact solution. In view of the special laboriousness of the computation, parallel algorithms using CUDA technology are implemented in this paper. A parallel algorithm for solving the Vlasov equation by the particle method is presented. The time dependence of entropy is obtained, its analysis is carried out.

### Short biography note

Perepelkin E. E., Sadovnikov B. I., Inozemtseva N. G. THE NEW MODIFIED VLASOV EQUATION FOR THE SYSTEMS WITH DISSIPATIVE PROCESSES.

B. I. Sadovnikov, N. G. Inozemtseva, and E. E. Perepelkin, Generalized Phase Space and Conservative Systems, Doklady Akademii Nauk, 2013, Vol. 451, No. 5, pp. 505–507

Perepelkin E.E., Sadovnikov B.I., Inozemtseva N.G., The properties of the first equation of the Vlasov chain of equations, J. Stat. Mech. (2015) P05019

Snytnikov V. N. et al. Space chemical reactor of protoplanetary disk //Advances in Space Research. –2002. – T. 30. –№. 6. –C. 1461-1467.

Toomre A. On the gravitational stability of a disk of stars // Astrophys. J. 1964. Vol. 139, No. 4. P. 1217–1238.

Miller R. H. Validity of Disk Galaxy Simulations // J. Comp. Phys. 1976. Vol. 21. P. 400.

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