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THE EQUATION OF STATE OF A PARTLY HOMOGENIZED PLASMA OF LOW-DENSE POROUS MATTER ^{*)}

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The equation of state (EOS) of a low-density porous substance plasma is proposed in the form of continuous media EOS containing, as a pressure control parameter, the degree of plasma homogenization. This parameter is a function of the initial porous structure as well as the current values of plasma density and temperature. The particles of non-homogenized fraction involved in a turbulent motion of plasma flows colliding inside the pores and do not contribute to pressure. The homogenization rate is the ratio of ion-ion collision length to the time of plasma flow passage through a pore. For the problem of thermal expansion of a flat layer of porous matter the feature of a porous substance EOS manifests itself in pressure temporal evolution, which is opposite to the case of homogeneous layer. EOS of partially homogenized plasma explains the experimental data on the delayed propagation of a shock wave in a porous substance and the maintaining the quasi-consolidated state of heated porous layer [1].

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References

- [1]. Gus'kov S., Yakhin R. A. Equation of state of a partially homogenized plasma of low-dense porous matter //Physics of Plasmas. – 2023. – T. 30. – №. 6. – C. 062709.

^{*)} [abstracts of this report in Russian](#)