

Determination of parameters for the propagation of jets of young stars and a plasma-focus installation.

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The construction of theoretical models of astrophysical jet observations, in which the process of formation of collimated outcomes and their acceleration takes place. Observation of the same distribution of jets also does not provide detailed information about the physical parameters of both the jets themselves and their environment. Interaction with these possibilities is acquired by attempts to recreate astrophysical conditions by means of laboratory experiments in which scaling plasma parameters close to those observed in young jet stars can be achieved. Numerical modeling makes it possible to verify the theoretical models of these processes, making it possible to identify parameters that are inaccessible to observation.

In this work, a numerical simulation of the propagation of a plasma bunch in the experimental facility PF-3 and in astrophysical jets was carried out to determine the parameters influencing the development of this bunch. The measurement process was started at various initial parameters of the system, after which there was a dependence on these parameters, as a rule, at the initial and final moments of time. An analytical estimate of the collimation angle was also obtained. The results in this paper are necessary to determine the unknown parameters of this system, such as: the density of the bunch and the initial velocity of the bunch.

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