Toroidal plasma dynamics in the vacuum and under falling on the barrier

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By the numerical simulation the toroidal plasma dynamics in the vacuum and during falling on the barrier is investigated. The calculations were made for wide initial conditions range in conformity with the parameters of the device ”Maraudr” (Philips Laboratory, USA).

The numerical simulation of the toroidal plasma moving in the vacuum shows the existence of the oscillatory toroid dynamics mode which defines by the current inside the toroid. The dynamical, ionization and temperature barrier-plasma interaction characteristics are computed in the interaction zone of the falling and reflected flows. When the ions concentration in the falling flow becomes $n < 10^{19}$ $[cm^{-3}]$ the interosculation of the falling and reflected flows occurs.

Therefore to describe this process the three-velocities and three- temperatures MHD numerical large-particles approach was used. This 2D numerical algorithm lets us to compute the plasma oncoming flows interaction and the electromagnetic impulse generation including whole nonequilibrium kinetic processes.