

Abstract Submitted
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A primary investigation of the concept of a throttled tokomak
YIAN LEI, XIAOFEI JI, JIANGUO CHEN, Beijing University — The technical challenges and economical issues of an ITER sized tokomak are among the main concerns of the feasibility of commercial fusion reactor. We believe an asymmetric throttled tokomak by increase the magnetic field strength a few times higher in a small section of the plasma torus can ease some of the issues by lowering down the parameters of the fusion plasma in the majority volume and raising the temperature in the throttled region. The low parameter plasmas are easier to be confined, heated up, and externally drive a current. The limited fusion region makes the protection and energy retrieving simpler. The asymmetry of the tokomak can also suppress many MHD instabilities. We are investigating the behavior of the plasmas in the vicinity of the throttle neck, including the mirroring effects, global electric charge displacement, particle acceleration in a toroidal magnetic field, and temperature and density profile changes. The trajectory and acceleration of single particles are calculated with a simplified current profile.

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