Abstract Submitted
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Studies of Neutral Penetration Depths Variation with Fueling Intensities of SMBI[1] ZHANHUI WANG, Southwestern Institute of Physics, YULIN ZHOU, Sichuan University, XUEQIAO XU, Lawrence Livermore National Laboratory, MIN XU, LIN NIE, Southwestern Institute of Physics, HAO FENG, Xihua University — It is very important to find methods of increasing the fueling efficiency and penetration depth of supersonic molecular beam injection (SMBI) for tokamak plasma fueling and other edge plasma physics studies such as ELM control or mitigation. With the new trans-neut module of BOUT++ boundary plasma turbulence code, it has further studied neutral penetration depths variation with different fueling intensities of SMBI. The physical model used in the code includes the plasma density, heat and momentum transport equations along with neutral density and momentum transport equations. With the physical model, the molecular transport process during SMBI with various injection speeds and densities, are simulated and compared to study the fueling depth and efficiency. It finds that the radial convection of molecule, rather than the effect of thermal diffusion, dominates the molecular transport process during SMBI. To achieve a better fueling depth and efficiency, it finds increasing the radial injection velocity is more effective than just increasing the molecule injection density.

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