Abstract Submitted
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Benchmarking and validation of global model code for negative hydrogen ion sources.[1] WEI YANG, Dalian University of Technology, China and Princeton Plasma Phys Lab, SERGEY AVERKIN, Tech-X Corporation, University of Colorado, and Worcester Polytechnic Institute, USA, ALEXANDER KHRABROV, IGOR KAGANOVICH, Princeton Plasma Phys Lab, YOU-NIAN WANG, Dalian University of Technology, China — Benchmarking can provide an evidence of the accuracy of computer simulations accompanied by the estimation of relevant errors, which is thus increasingly being recognized. We develop a global model for negative hydrogen ion sources (GMNIS) and perform the benchmarking of the code with global enhanced vibrational kinetic model (GEVKM). The VDF and the H^- number density obtained from two codes are in good agreement with each other. The small discrepancies can be attributed to the differences in the electron temperature and electron number density caused by different solution procedures and transport properties utilized in each code. In addition, the GMNIS is validated with experimental measurements operated in an ECR discharge. The model qualitatively or even quantitatively reproduces the experimental H^- number density. Benchmarking and validation of codes are presented here with the goal of making codes to become a reliable predictive tool and ultimately aiding in developing optimized negative ion beams for ITER.

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