Abstract Submitted
for the DPP17 Meeting of
The American Physical Society

Three-Dimensional FEM-PIC Simulation of Ion Extraction with CEX Collision.[1] TAO HUANG, XIAOLIN JIN, MEIYU LIU, BIN LI, University of Electronic Science and Technology of China — Electric propulsion has the characters of high specific impulse and total efficiency, which results in a reduction in the amount of propellant required for a given space mission or application compared to other conventional propulsion methods. Over the past few decades, its use in spacecraft has grown steadily worldwide, and the modeling and simulation techniques have been playing a more and more important role in developing advanced electric thrusters. In this paper, the ion extraction in the optics system of ion thruster was described, which solves particle trajectory, CEX collision, space charge, the Poisson's equation self-consistently, as the three dimensional FEM-PIC method. The single and seven grid apertures models were considered, respectively. The spatiotemporal distributions of the total ion beam current and the generation of CEX ions were obtained, and the effects of CEX collision on ion extraction process were discussed.

[1]Fundamental Research Funds for the Central Universities (Grant Nos. ZYGX2016J065)

Tao Huang
University of Electronic Science and Technology of China

Date submitted: 12 Jul 2017 Electronic form version 1.4