

Abstract Submitted
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Effect of segmented electrode length on the performances of Hall thruster PING DUAN, LONG CHEN, GUANGRUI LIU, XINGYU BIAN, YAN YIN, Dalian Maritime University — The influences of the low-emissive graphite segmented electrode placed near the channel exit on the discharge characteristics of Hall thruster are studied using the particle-in-cell method. A two-dimensional physical model is established according to the Hall thruster discharge channel configuration. The effects of electrode length on potential, ion density, electron temperature, ionization rate and discharge current are investigated. It is found that, with the increasing of segmented electrode length, the equipotential lines bend towards the channel exit, and approximately parallel to the wall at the channel surface, radial velocity and radial flow of ions are increased, and the electron temperature is also enhanced. Due to the conductive characteristic of electrodes, the radial electric field and the axial electron conductivity near the wall are enhanced, and the probability of the electron-atom ionization is reduced, which leads to the degradation of ionization rate in discharge channel. However, the interaction between electrons and the wall enhances the near wall conductivity, therefore the discharge current grows along with the segmented electrode length, and the performance of the thruster is also affected.

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