

Numerical simulation of a plasma behavior to time-varying external electromagnetic field

Yasushi Ikeda[1]; Tohru Hada[1]; Shuichi Matsukiyo[2]; Shunjiro Shinohara[3]; Kyoichiro Toki[4]

[1] ESST, Kyushu Univ; [2] ESST, Kyushu Univ.; [3] Advanced Energy Engineering Science, Kyushu Univ; [4] Mechanical Systems Engineering, Tokyo University of Agriculture and Technology

Electric propulsion systems can provide high specific thrust compared to chemical propulsion systems, and are suited to long duration missions such as planetary missions.

On the other hand, in case of many of the conventional electric propulsion systems, the performance is limited by electrode wastage.

In order to overcome this difficulty, several novel ways to drive plasma via external electromagnetic field have been proposed [Toki et al., 2004], but not much has been known regarding the plasma behavior when it is exposed to time-varying external field.

In this presentation, we show our recent results on the plasma response to the time-varying external electromagnetic field using 1D full particle simulation. Implications of the results to the next generation electric propulsion systems will be discussed.