

||||| 原著論文 |||||

高電圧太陽電池アレイのプラズマ干渉に関する実験的研究

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Laboratory Experiments on Plasma Interactions with High Voltage Solar Array

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Abstract

The current-voltage characteristics of the array electrodes on the dielectric material in laboratory plasma have been studied in association with the interaction of high-voltage solar array with the ambient space plasma. It has been found that the charging effect and secondary electrons of the dielectric material surrounding the electrodes play an important role in collection of the electrode current. The charging effect suppresses the electrode current, while the secondary electrons enhance the electron current to the electrode. In the electrode array (3×3 electrodes separated by 0.5~10 cm), the current of each electrode was generally smaller than that of single electrode, but a rapid enhancement of the electrode current was observed when spacing of the electrodes was less than 1.5 cm. These results indicate a possibility that we can reduce the risk of electric discharge if we use the dielectric material with a low secondary-emission yield and select the distribution of the solar array voltage minimizing the high voltage-plasma interaction.