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A New Simulation Approach to Control Plasma Uniformities AKIHIRO TSUJI, YASUYOSHI YASAKA, Department of Electrical and Electronic Engineering, Graduate School of Engineering, Kobe University — Plasma simulations have never been used for a device control in the field although they have been useful to understand physical phenomena in global and local regions. It is because the existing plasma simulations cannot calculate input parameters such as the distributions of power and gas from output parameters such as the distribution of the electron density n_e. To build a new control method with a simulation system, the framework of the existing simulation should be reconstructed as the inverse problem. A new simulation system is being developed as the first step. It consists of a power feeding part, a fluid simulation part and a transfer function part. The main points of the simulation system are to introduce the power coupling coefficient a_p which gives information of the device setting and to add some functions to inversely calculate the a_p from the distribution of the plasma parameters. In the verification of the two-dimensional model, it is shown that the root-mean-square error between the distribution of n_e calculated by the simulation and the target distribution is 1.8 %. The some input parameters can be inversely calculated from the output parameter by using the same procedure. Therefore, this approach can be one of the solutions to control plasma uniformities.

Akihiro Tsuji
Department of Electrical and Electronic Engineering,
Graduate School of Engineering, Kobe University

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