

Abstract Submitted
for the DPP13 Meeting of
The American Physical Society

A new algorithm for fluid simulation of high density plasma discharges¹ SEON-GEUN OH, YOUNG-JUN LEE, HEEHWAN CHOE, JAE-HONG JEON, JONG-HYUN SEO, Korea Aerospace University — Low temperature, high density plasma sources are widely used for the electronic device fabrications such as semiconductor, flat panel display, and solar cell. The inductively coupled plasma or the capacitively coupled plasma reactors are typical ones in these processes. Fluid simulation is one of the methods for transport modeling of high density discharge, because the profiles of plasma quantities are easily obtained. The short shielding time scale of an electric field perturbation is a major restriction on the simulation time step. In most cases, the simulation time step in the explicit method is less than 10^{-13} sec. To overcome this limitation, a new method for steady-state fluid simulation of high density plasma discharge is suggested. Following the physical origin of restriction on simulation time step, a new method is developed using both analytic and numerical methods. A simple application of the new method with previously known one is given to study the validity of the method.

¹This work was supported in part by the International collaborative R&D program (N0000678), and by the Industrial Strategic Technology Development Program (10041681) funded by the Ministry of Trade, Industry and Energy (MOTIE, Korea).

HeeHwan Choe
Korea Aerospace University

Date submitted: 12 Jul 2013

Electronic form version 1.4