

Abstract Submitted
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Extended dielectric relaxation scheme for fluid transport simulations of high density plasma discharges¹ DEUK-CHUL KWON, MI-YOUNG SONG, JUNG-SIK YOON, Natl Fusion Res Inst — It is well known that the dielectric relaxation scheme (DRS) can efficiently overcome the limitation on the simulation time step for fluid transport simulations of high density plasma discharges. By imitating a realistic and physical shielding process of electric field perturbation, the DRS overcomes the dielectric limitation on time step. However, the electric field was obtained with assuming the drift-diffusion approximation. Although the drift-diffusion expressions are good approximations for both the electrons and ions at high pressure, the inertial term cannot be neglected in the ion momentum equation for low pressure. Therefore, in this work, we developed the extended DRS by introducing an effective electric field. To compare the extended DRS with the previous method, two-dimensional fluid simulations for inductively coupled plasma discharges were performed.

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