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Comparative Study in Stabilization Methods for Capacitively Coupled Plasma Simulation Using Finite Element Method. HYONU CHANG, Plasma Technology Research Center, National Fusion Research Institute, PLASMA FUNDAMENTAL TECHNOLOGY RESEARCH TEAM TEAM — Many cases of hydrodynamic plasma analysis solve continuity equation for charged particles and energy balance equation for electron temperature adopting drift-diffusion approximation. In the transient convection-diffusion equation, finite element (FE) and finite difference schemes are unstable when convective term dominates diffusive term. In capacitively coupled plasma (CCP) cases, numerical instability is unavoidable due to enormous convection induced from the high electric field near the electrode. Several numerical stabilization methods have been developed to overcome this kind of instability problem in finite element scheme. Each of discontinuous Galerkin method (DGM), Petrov-Galerkin method (PGM) and characteristic Galerkin method (CGM) which are the developed stabilization methods, are applied to two-dimensional FE fluid code and suitability for CCP model is investigated.

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