

Abstract Submitted
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3D CFDTD PIC/Fluid Hybrid Simulations on Plasma Processing of Materials M.C. LIN, Tech-X — In this work, we propose to use a hybrid method to numerically model the plasma processing of materials including a magnetron sputtering, inductively coupled plasmas (ICPs), capacitively coupled plasmas (CCPs), and microwave plasma enhanced chemical vapor deposition (MPECVD) reactors for getting more physics insight in these plasma processes and better understanding. The neutral atoms in the weakly ionized plasma are represented by a fluid model and the plasma and externally applied fields are described by particle-in-cell (PIC) macro-particles evolving with a conformal finite-difference time-domain (CFDTD) method. Here, we will demonstrate the CFDTD PIC/fluid hybrid simulations of the plasma processing including a magnetron sputtering, an ICP, a CCP, and an MPECVD. All these simulation models are based on the experiments and are still under study and development in collaborating with the experimentalists in industry and academia.

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