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An External Circuit Model for 3D Electromagnetic Particle-In-Cell Simulations[1] MING-CHIEH LIN, CHUANDONG ZHOU, DAVID N. SMITHE, Tech-X Corporation, GYROPIC TEAM — In this work, an algorithm for coupling external circuit elements to electromagnetic (EM) particle-in-cell (PIC) simulations is developed. The circuit equation including an external voltage or current source, resistance, inductance, capacitance, and a dynamic load is solved simultaneously with the EM PIC updaters through an instant measured voltage across the system to obtain the supplied current for feeding into the system. This external circuit model has been demonstrated and implemented in a 3D conformal finite-difference time-domain PIC code, Vorpal.

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