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Nonlinear Hydrodynamic Effects in Dense Microplasmas[1] DYLAN PEDERSON, KONSTANTINOS KOURTZANIDIS, LAXMINARAYAN RAJA, The University of Texas at Austin — Nonlinear behavior in plasma interactions with GHz electromagnetic waves arises from nonlinearities in the electron momentum equation, among other sources. In systems where there may be a high local electric field amplification (resonators), dense microplasmas of size much smaller than the wavelength are formed near regions of high fields. In a typical Finite-Difference Time-Domain simulation, a plasma is modeled as a (linear) Drude material, which does not capture the nonlinear polarization terms of a plasma. In this work we couple the nonlinear electron momentum equation to electromagnetic simulation in order to explore nonlinear behavior.

Dylan Pederson
The University of Texas at Austin

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