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Simulation study of nonlinear saturation of cross beam energy transfer in Top9 experiments at the Omega laser facility[1] KHANH LINH NGUYEN, Laboratory for Laser Energetics, LIN YIN, BRIAN ALBRIGHT, Los Alamos National Laboratory, DUSTIN FROULA, AARON HANSEN, DAVID TURNBULL, JOHN PALASTRO, Laboratory for Laser Energetics — In laser-based inertial confinement fusion (ICF), an ensemble of high energy laser beams drives the implosion of a capsule containing nuclear fuel. Ablation of the capsule surface, however, forms a plasma corona apt for laser-plasma instabilities that can limit the performance of the implosion. Among these instabilities, cross beam energy transfer (CBET), or the exchange of energy between overlapped beams mediated by ponderomotively excited ion-acoustic waves, can scatter light away from the capsule surface. At the Laboratory for Laser Energetics (LLE), an experimental platform, TOP9, has been developed for focused studies of CBET in ignition relevant plasmas. These experiments will establish the limits of linear theory, but an understanding of how CBET saturates at these limits requires detailed simulations. Here we will present the results of VPIC particle-in-cell simulations exploring mechanisms for CBET saturation.

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