

Abstract Submitted
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Beam Loading Scenarios with Electrons for PWFA LC in the Blowout Regime¹ LANCE HILDEBRAND, FEI LI, University of California, Los Angeles, XINLU XU, SLAC National Accelerator Laboratory, WEIMING AN, Beijing Normal University, YUJIAN ZHAO, CHAN JOSHI, WARREN MORI, University of California, Los Angeles — We examine realistic beam loading scenarios for PWFA LC based on stages or an afterburner. We consider loading an electron beam into the wake created by a an electron beam driver. For collider applications the witness beam will have .1 to 1 nC of charge and normalized emittances of ~ 100 nm. This leads to matched spot sizes ~ 100 nm and witness beam densities 10^5 times the background density. For such parameters it may be important to consider ion motion. We use QuickPIC and QPAD simulations and theory to investigate the effects of asymmetries in the wakes and the effects of ion motion both in isolation and together. Preliminary results will be presented on the energy spread and emittance preservation, and efficiency of from the drive beam to the witness beam for energies of interest to a collider.

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