

Abstract Submitted  
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**Beam quality from self and ionization induced trapping in the nonlinear LWFA regime**<sup>1</sup> ASHER DAVIDSON, WEI LU, CHAN JOSHI, UCLA, LUIS SILVA, JOANA MARTINS, RICARDO FONSECA, IST, WARREN MORI, UCLA — In plasma based accelerators (LWFA and PWFA), the methods of injecting high quality electron bunches into the accelerating wakefield is of utmost importance for various applications. Understanding how injection occurs in both self and controlled scenarios is therefore important. We present results from high fidelity OSIRIS simulations on the beam quality that can be obtained from self and ionized induced trapping in the nonlinear LWFA regime. We compare trapping thresholds from the simulations to analytical expressions. We also quantify how the beam quality of 1.5-5 GeV beams can be improved through angle and energy selection as well as quantify the slice energy spread and emittance. We also study the effect of ion motion and the axial density profile. Preliminary results on inputting beams from OSIRS into the FEL code GENESIS will be presented.

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Asher Davidson  
UCLA

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