

Abstract Submitted  
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**Modeling laser wake field acceleration with QUICKPIC** JORGE VIEIRA, RICARDO FONSECA, LUIS SILVA, Instituto Superior Tecnico Portugal, CHENGKUN HUANG, VIKTOR DECYK, MIAOMIAO ZHOU, MICHAIL TZOUFRAS, WEI LU, FRANK TSUNG, WARREN MORI, University of California Los Angeles, JAMES COOLEY, THOMAS ANTONSEN, University of Maryland — We model laser wake field acceleration with the Quasi Static PIC code QUICKPIC, in both uniform and parabolic plasma channels. Since in LWFA the laser evolution is much slower than the plasma response, QUICKPIC employs the Quasi Static Approximation, where the plasma response is calculated through a quasi-static field solver for each 2d slice. The laser is evolved according to the ponderomotive guiding center approximation, with time steps that correctly resolve distances on the order of the rayleigh length. We focus our research in the current state of the art experimental laser and plasma parameters. Our simulations show computational speed up of 2 to 3 orders of magnitude in comparison to full 3D PIC simulations in OSIRIS. We find very good agreement between the codes.

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