

Abstract Submitted
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Wakefield Generation in Compact Rectangular Dielectric Loaded Structures Using Flat Beams¹ PETER STOLTZ, Tech-X Corporation, PHILIPPE PIOT, Northern Illinois University, BEN COWAN, Tech-X Corporation, FRANCOIS LEMERY, Northern Illinois University, DANIEL MIHALCEA, Fermilab, CHRIS PROKOP, Northern Illinois University, JONATHAN SMITH, Tech-X UK Ltd., DAVID SMITHE, Tech-X Corporation — Wakefields with amplitude in the 10s MV/m range can be routinely generated by passing electron beams through dielectric-loaded structures. The main obstacle in obtaining high field amplitude (in the GV/m range) is the ability to focus the high-peak-current electron beam in the transverse plane to micron level, and to maintain the focusing all the way along the dielectric structure. In this paper we explore the use of a flat, high-peak current, electron beams to be produced at the Fermilab NML facility to drive dielectric loaded structures. Based on beam dynamics simulation we anticipate that we can obtain flat beams with very small vertical size (under 100 microns) and peak current is in excess of 1 kA. We present simulations of the wakefield generation based on theoretical models and PIC simulations with VORPAL.

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