

Abstract Submitted
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Numerical study of plasma wakefields driven by trains of electron bunches¹ YUN FANG, CHENGGUN HUANG, PATRIC MUGGLI, WEIMING AN, WARREN MORI — We study numerically the excitation of plasma wakefields by a train of electron bunches. The purpose is to find a regime in which the wakefield excited by individual electron bunches add and have a large amplitude and a large transformer ratio. This scheme will produce a high energy accelerated bunch with a low energy drive train in a single plasma wakefield accelerator stage. The transverse size of the bunches must be maintained long enough for the driving bunches to efficiently transfer their energy to a trailing witness bunch. It is studied experimentally at the Brookhaven National Laboratory Accelerator Test Facility (ATF). We also investigate the effect of a transverse electron plasma profile on the period of the excited wakefield, an effect that may play a role in the experiments using a capillary discharge as a plasma source. Detailed simulation results will be presented.

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