

Abstract Submitted
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Generation of Electron Microbunches Trains with Adjustable Sub-picosecond Spacing.¹ PATRIC MUGGLI, USC, VITALY YAKIMENKO, BNL, THEMOS KALLOS, USC, MARCUS BABZIEN, KARL KUSCHE, BNL — We demonstrate that trains of subpicosecond electron microbunches, with subpicosecond spacing, can be produced by placing a mask in a region of the beam line where the beam transverse size is dominated by the correlated energy spread. The particles are selected based on the scattering of their emittance at the mask. The experiment was performed with the Brookhaven National Laboratory Accelerator Test Facility 60 MeV beam. We show that the number, length, and spacing of the microbunches can be controlled through the parameters of the beam and the mask. Trains with one to eight equidistant microbunches have been produced. The microbunches spacing was adjusted in the 100 to 300 μm or 300 fs to 1 ps range. The train structure is measured using CTR interferometry. Such microbunch trains can be further compressed and accelerated, and have applications to free electron lasers (FELs) and plasma wakefield accelerators (PWFAs).

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