

Abstract Submitted
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Simulating Space-Charge Physics of High-Current Beams with a Green's Function Approach¹ MARK HESS, CHONG SHIK PARK, Indiana University Cyclotron Facility — High-current (100's A-10 kA) bunched electron beams are featured in a wide variety of high-power microwave sources, such as klystrons, backward wave oscillators, magnetrons, and ubitrons, for producing microwave power in the range of 100's MW-1 GW. For these beams, space-charge fields are extremely important, and the combination of beam bunching and the presence of nearby conductor surfaces imply that a fully electromagnetic approach is needed to calculate the fields. We demonstrate how a time-dependent Green's function approach can be utilized for computing space-charge fields. Since a Green's function is generated from a delta function source, it can be readily used for modeling arbitrarily small beam bunches making this method attractive for high-current bunched beam simulations.

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