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Progress Toward Experiments on an Integrated 10-MeV X-band Photoinjector Powered by a Two-Beam Acceleration Technique (student)

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Two-beam acceleration is a powerful method to generate high accelerating fields by utilizing short radiofrequency pulses. The Argonne Wakefield Accelerator facility is applying a two-beam acceleration approach to an X-band radiofrequency gun. This gun has experimentally demonstrated an electric field on the photocathode of ~ 400 MV/m. The next phase of this experiment will involve adding a short X-band linac to boost the beam energy up to ~ 10 MeV. This paper summarizes the optimization of the linac and beam dynamics simulations in the integrated system over a wide range of operating parameters and demonstrates that the available setup will support the generation of bright or ultrashort beams with possible applications to compact light sources including inverse Compton scattering.

Working group

WG4 : Novel structure acceleration

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