



Contribution ID: 1137 Contribution code: TUPL119

Type: **Poster Presentation**

Experimental generation of the transversely uniform electron bunches at the CLEAR facility at CERN

Tuesday, 9 May 2023 16:30 (2 hours)

Electron beams with a flat-top transverse distribution are highly desired for uniform dose delivery in irradiation applications, like studies of radiation damage to electronics and radiotherapy, as well as for potential applications in the improvement of light sources. In this work, we report on the optimization of the electron photocathode injector parameters which allow such uniform distributions to be reached. This can be achieved starting from a standard Gaussian transverse distribution of the laser, by tailoring the space charge forces and the magnetic field of the solenoid. We report on the first experimental demonstration of this method at the CLEAR facility at CERN.

Funding Agency

Footnotes

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Yes

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Session Classification: Tuesday Poster Session

Track Classification: MC2: Photon Sources and Electron Accelerators: MC2.A08: Linear Accelerators