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Updates on the Cornell cryo-MTE-meter beamline

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A critical factor in determining the limit of the brightness of an electron beam is the mean transverse energy (MTE) of its source, which describes the spread in transverse momentum of electrons at the moment of emission from the source. To increase beam brightness, there has been much work in growing novel photocathodes with low MTE and high quantum efficiency (QE) near threshold photoemission excitation energies. Therefore, it is important to have a testing platform for accurately measuring the MTE of a cathode over a range of cryogenic temperatures and photoexcitation energies, with self-consistent results across multiple measurement techniques. Here, we will discuss the characterization and operation of the Cornell Cryo-MTE-Meter beamline which aims to fulfill these criteria for a robust photocathode testing platform.

Footnotes

• C. Zhang et al., "Reconstructing 4D source momentum space via aperture scans", in Proc. IPAC'23, Venice, Italy, May 2023, pp. 4595-4597. doi:10.18429/JACoW-IPAC2023-THPL071

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