Contribution ID: **2372** Contribution code: **SUPM067** Type: **Student Poster Presentation**

Wafer-compatible photocathode plug design for high gradient RF photoinjector

Sunday 1 June 2025 14:00 (2 hours)

Single crystal alkali antimonide photocathodes have been shown to produce brighter beams than their polycrystalline counterparts. These single crystal semiconductors require a lattice matched substrate to be grown, but current INFN plugs lack the capability for this growth. To relieve this issue, we modified the INFN plug to hold a disk 1cm in diameter. This allows for studies of a wide range of advanced photocathodes and geometries on arbitrary substrates in high gradient photoinjectors. We show the modified design, analysis of the local field at the cathode and cavity detuning, and demonstrate the principle with a 1cm Yttrium disk.

Footnotes

Paper preparation format

LaTeX

Region represented

America

Funding Agency

Center for Bright Beams

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Session Classification: Student Poster

Track Classification: MC3: Novel Particle Sources and Acceleration Techniques: MC3.T02 Electron Sources