Contribution ID: **489** Contribution code: **TUPS069** Type: **Poster Presentation**

Status of the CARIE high gradient photocathode test facility at Los Alamos National Laboratory

Tuesday 3 June 2025 16:00 (2 hours)

This talk will report on the status of commissioning of the Cathodes And Radio-frequency Interactions in Extremes (CARIE) C-band high gradient photoinjector test facility and other high-gradient C-band research activities at Los Alamos National Laboratory (LANL). The construction of CARIE began in October of 2022. CARIE is powered by a 50 MW 5.712 GHz Canon klystron and will house a high gradient copper RF photoinjector with a high quantum-efficiency cathode and produce an ultra-bright 250 pC electron beam accelerated to the energy of 7 MeV. The klystron was received, installed, and conditioned in 2024. The output of the klystron is connected to a circulator that was conditioned to operate for up to 12 MW of power. The WR187 waveguide line brings the power from the circulator into a concrete vault. The test RF injector is made of copper and does not have cathode plugs. It will be commissioned to validate operation of the CARIE facility in Spring of 2025. The second injector that will accommodate cathode plugs is in fabrication. The designs of the photoinjector and the beamline, and status of the high-power testing of the injector and other C-band components will be presented.

Footnotes

Paper preparation format

Word

Region represented

America

Funding Agency

Los Alamos National Laboratory LDRD Program

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Session Classification: Tuesday Poster Session

Track Classification: MC2: Photon Sources and Electron Accelerators: MC2.T02 Electron Sources