SRF2025 TOKYO

22ND INTERNATIONAL CONFERENCE ON RF SUPERCONDUCTIVITY

September 21-26, 2025

Contribution ID: **157** Contribution code: **TUP65** Type: **Poster Presentation**

Overview of metal cathode R&D for the CW L-band SRF photoinjector at DESY

Tuesday 23 September 2025 14:30 (3 hours)

Thread-mounted cathode installation directly at the backwall of the gun cavity allows cavity cleaning following cathode installation and thus beneficial for RF performance of the injector. Recent vertical tests of the CW L-band SRF gun cavity with a copper cathode installed demonstrated world-record high axial electric fields (up to 50 MV/m). While beneficial for RF performance, photoemissive performance of copper degrades quickly following air and water exposure (high pressure water rinsing followed by 90 degree bake out). In this work, we provide an overview of metal photocathode R&D activities aimed at addressing a challenging set of requirements with the goal of meeting top-level parameters of the future CW / high-duty-cycle upgrade of the European XFEL: 100 pC at 1 MHz in CW regime.

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Yes

Footnotes

Funding Agency

Work performed in the framework of R&D for future accelerator operation modes at the European XFEL and financed by the European XFEL GmbH.

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Session Classification: Tuesday Poster Session

Track Classification: MC4: SRF Technologies