



Contribution ID: 2297 Contribution code: TUPA032

Type: **Poster Presentation**

## Copper photocathodes for the modified 10 Hz gun on the CLARA accelerator

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

During the last run, the CLARA accelerator ran with a 2.5 cell 10 Hz S-band RF gun which had a modified back plate to allow the use of INFN-style photocathode pucks. Previously this gun had used a solid wall back plate that also acted as the photocathode\*.

This presentation describes the different photocathodes that were used during the run and the various methods employed to prepare them for use. An initial cathode which was based on a solid Mo puck with the thin film of Cu grown using magnetron sputtering was seen to give high initial QE but a very fast degradation rate. Subsequent cathodes were hybrids with a Mo body and a solid copper tip for the active area. Several cathodes prepared using alternative techniques were employed, giving varied initial QE and lifetime. The final cathode used had satisfactory QE and a long enough lifetime to deliver a six month period of beam exploitation for external facility users.

- D. Angal-Kalinin, et al, 'Design, specifications, and first beam measurements of the compact linear accelerator for research and applications front end' *Physical Review Accelerators and Beams* 23 (2020) 044801 \*\* T.C.Q. Noakes, et al, 'Photocathode preparation and characteristics of the electron source for the VELA/CLARA facility' *Proceedings of the International Particle Accelerator Conference 2018 (IPAC-18)*, THPMK063, 2018, Vancouver, Canada

### Funding Agency

UKRI-STFC

### Footnotes

### I have read and accept the Privacy Policy Statement

Yes

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**Session Classification:** Tuesday Poster Session

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