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Experimental investigations and Simulations of Dark Current in ELBE SRF gun-II

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In the high gradient rf photoinjectors, dark current is the “unwanted beam” not produced by the cathode drive laser. It is a part of field emission from the cavity and photocathode, which is accelerated through the gun. Dark current can cause beam loss, increase the risk of damage to accelerator components, and create additional background for beam users. Furthermore, during operation of the ELBE srf gun, the dark current has been found to correlate with the photocathode QE and life time. Therefore, understanding the sources as well as the dynamics of dark current is crucial to machine safety and gun quality.

In this paper we present our experimental investigations of the dark current at the ELBE SRF gun-II. The beam dynamics of the dark current is studied with the ASTRA code, which helps us to track the field electrons starting from the cathode area and from other sources, so that we can understand their different contributions to the dark current.

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Footnotes

I have read and accept the Privacy Policy Statement

Yes

Primary author: XIANG, Rong (Helmholtz-Zentrum Dresden-Rossendorf)

Co-authors: ARNOLD, Andre (Helmholtz-Zentrum Dresden-Rossendorf); RYZHOV, Anton (Helmholtz-Zentrum Dresden-Rossendorf); SCHABER, Jana (Helmholtz-Zentrum Dresden-Rossendorf); TEICHERT, Jochen (Helmholtz-Zentrum Dresden-Rossendorf); MICHEL, Peter (Helmholtz-Zentrum Dresden-Rossendorf); MURCEK, Petr (Helmholtz-Zentrum Dresden-Rossendorf); NIEMCZYK, Raffael (Deutsches Elektronen-Synchrotron DESY at Zeuthen); MA, Shuai (Helmholtz-Zentrum Dresden-Rossendorf); GATZMAGA, Stefan (Helmholtz-Zentrum Dresden-Rossendorf)

Presenter: XIANG, Rong (Helmholtz-Zentrum Dresden-Rossendorf)

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