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Dark current studies for a SW C-band electron gun with a deflector

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To generate the very high brightness beams in light sources, injectors based on radiofrequency photo-guns with very high peak electric fields on the cathode are used. However, this very high surface electric field on the surface of a radio frequency cavity leads to the generation of dark current due to the field emission effect which can damage the instrumentation and radio-activate components. Consequently, it is important to reduce the emission of these electrons and evaluate the subsequent transportation. In this paper, the deflector has been innovatively positioned at the exit of the photo-gun so as to reduce the dark current as much as possible. The dark current emission and spectrum of the dark current of the C-band electron gun have been evaluated by Particle-In-Cell simulations. The dark current before the accelerating sections has been captured and observed both with and without the deflector.

Footnotes

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Asia

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