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Secondary, thermionic and delta electron emission from thin targets

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Thin objects in the form of wires, foils or strips are often used as targets in various instruments that measure beam parameters or for other purposes. They usually cause only small beam perturbations and suffer from relatively low temperature increases. The beam induces the emission of secondary electrons, which are usually the source of the measured signal. In high brightness beams, the targets can reach high temperatures, which lead to thermionic current emission. Also, a small amount of delta electrons is emitted, which has a negligible effect on the emitted current but affects the beam heating. These three types of electrons have different properties and influence the measured signal as well as the temperature evolution of the target. This paper discusses how the signal is generated by the escaping electrons, how bunch field affects this signal and how the target temperature depends on the electron emission.

Footnotes

Funding Agency

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Yes

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