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Emission of secondary, thermionic and delta electrons from thin targets

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Thin objects such as wires, foils, or strips are commonly used as targets in instruments designed to measure beam parameters, among other applications. These targets typically induce only minor beam perturbations and experience moderate temperature increases. The interaction with the beam stimulates the emission of secondary electrons, which primarily contribute to the measured signal. In the presence of high brightness beams, targets may attain elevated temperatures, leading to thermionic emission of electrons. Additionally, a minor quantity of delta electrons is also released. Although these electrons minimally affect the total emitted current, they significantly reduce the beam-induced heating. This paper explores how these various electron emissions affects signals and impact the target's temperature.

Footnotes

Funding Agency

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Yes

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