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PEPITES: an ultra-thin beam profiler with wide dynamic range for charged particle beams

Tuesday 9 September 2025 16:00 (2 hours)

PEPITES* is an ultra-thin and wide dynamic range charged particle beam profiler. Its signal uses secondary electron emission, effective with only O(10 nm) of matter and highly linear with beam intensity. Thin film techniques are used for the sensitive area, enabling multiple monitor variants. Typical electrodes are membranes with 50 nm thick gold strips or fully metallized. Several systems will be presented. A first PEPITES profiler was installed at ARRONAX** in May 2022 and is used routinely. It features a 10 µm Water Equivalent Thickness (WET) and two 32-strip 7×7 cm² planes to sample the beam along X and Y, each facing a positively biased plain electrode to collect the electrons. A second monitor is under development with CNAO*** for therapeutic beams. Its lower, 5 µm WET, is motivated by the long 6.5 m patient-monitor distance and is obtained by replacing the anode plans by off-axis metallic bars. First results show that the resulting non-parallel collection field has minimal impact on profiles. Portable devices for profile or intensity measurement withstanding flash beams and viability of PEPITES for O(10 fs) laser-plasma beams, like at LOA****, will also be discussed.

Footnotes

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