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Timepix3 performance in pulsed power operation

The physics aims at the proposed CLIC linear e^+e^- collider pose challenging requirements on the performance of the detector system. In particular for the vertex detector the principal challenge is building an ultra-low mass (˜0.2% X_0 per layer) detector that can provide a point resolution of a few µm as well as ˜10 ns time stamping capabilities.
To reach such low material budget, CLIC uses an air-flow cooling system in the inner vertex region. This requires very low power dissipation, which is achieved by exploiting CLIC's low duty cycle (˜<0.001%) and beam structure, allowing pulsed power operation of the pixel detector.
Timepix3 is the first readout chip to include power pulsing features, such as, in the analog domain, allowing to switch dynamically between nominal power and shutdown modes and, in the digital domain, gating the clock of the pixel matrix.
This contribution reports the performance of the TimePix3 chip operating in pulsed power, in terms of power saving, detection efficiency and noise performance. Measurements were performed in a beam test taking as reference tracks provided by a telescope, as well as in the laboratory using a radioactive source.

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