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Application of the Punch-through effect to safeguard silicon sensors against damage due to beam loss

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The punch-through effect is being developed as a way to safeguard against damage to silicon detectors, when a beam loss collapses the field in the sensors and brings the readout implants close to the bias voltage.
We evaluate the efficiency of the punch-through protection (PTP) by flooding the sensors with IR radiation, and measure the voltages on the strips on the readout side, which are supposed to be at ground.
The voltages are measured as a function of PTP geometry, irradiation levels, temperature, and the external biasing.
Since the efficiency depends on the relative value of 3 resistors (PTP, bulk, implant) we discuss practical applications and limitations.

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