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Ultra Thin Secondary Electron Emission Sensors for Beam Monitoring

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The Extra Low Energy Antiproton (ELENA) is the new deceleration ring installed in the Antimatter Factory at CERN. Thanks to the introduction of ELENA, the antimatter experiments will receive an antiproton beam with an energy down to 100 keV, allowing improved performance and opening the door to new and exciting discoveries.
On the other hand, such a low energy beam required the development of new beam monitoring devices, capable of detecting the antiprotons without stopping them, while at the same time fulfilling the purpose of reducing their energy to below the trapping value of 10 keV.
We describe the development and the characterization of a new beam monitoring detector, based on Secondary Electrons Emission, with a sensitive foil with a thickness as low as 110 nm. The detector, developed by the IRRAD team at CERN and by the AEgIS Collaboration, was tested with a 24 GeV proton beam and with 100 keV antiprotons.

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