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Single Electron Interference and Diffraction Experiments with a High Energy Physics Detector

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A Young-Feynman two-slit interference experiment for single electrons was carried out by placing two nanometric slits inside a transmission electron microscope and using a monolithic CMOS detector developed for HEP collider experiments. The fast readout of the sensor allows recording single-electron frames with a maximum time resolution of 0.4 microseconds and obtaining high statistics samples of single electron events, within a time interval short enough to guarantee the stability of the system and the coherence conditions of illumination. The latest results on interference and diffraction phenomena in conceptually clean experiments will be shown.

Primary authors: GABRIELLI, Alessandro (BO); ZOCCOLI, Antonio (BO); GIORGI, Filippo Maria (BO); ALBERGHI, Gian Luigi (BO); MATTEUCCI, Giorgio (Universita' di Bologna); POZZI, Giulio (Universita' di Bologna); VILLA, Mauro (BO); SEMPRINI CESARI, Nicola (BO)

Presenter: ALBERGHI, Gian Luigi (BO)