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Characterization of neutron- and proton-irradiated LGADs from Teledyne e2v

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Exploiting their excellent timing resolution, Low Gain Avalanche Detectors (LGADs) were chosen for next-generation timing detectors at the HL-LHC and other high-energy experiments. When in operation, the detectors will be exposed to high rates of radiation, hence their radiation hardness is one of the key factors to be optimised during detector development. In this talk, we will present results on neutron- and proton-irradiated individual $1 \times 1 \text{ mm}^2$ LGAD sensors produced by Teledyne e2v (Te2v). The development and testing of the sensors is undertaken by the University of Oxford, the University of Birmingham, the Rutherford Appleton Laboratory, and the Open University.

Leakage current and gain-layer depletion voltages up to neutron fluence of 10^{16} cm^{-2} will be presented alongside timing resolution of proton irradiated and unirradiated individual LGAD devices. Performance of LGAD readout amplifier board developed at the University of Oxford will be shown. We will share first look at large 15×15 LGAD arrays from Batch 2 of wafers manufactures at Te2v together with future plans and tests.

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