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Measurements on NLGAD detectors

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In the last few years, Low Gain Avalanche Detectors (LGAD) have demonstrated their outstanding performance when detecting high-energy charged particles. However, the very nature of electrons and holes under avalanche multiplication highlights that this good performance is diminished when they are to detect low penetrating particles (e.g. low-energy protons or soft x-rays). A novel design of an LGAD detector, the NLGAD, was designed and fabricated at CNM in order to try to overcome this drawback. A qualitative description of the NLGAD concept is presented in this work, along with gain response measurements of the first prototypes under visible light of 660nm and 15keV x-rays. Additionally, a review of the gain response under visible light of 404nm and IR light of 1064nm, previously studied, is also evaluated in this work. The results demonstrate the potential of the NLGAD for experiments that imply the detection of low penetrating particles.

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