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New results on thin entrance window LGAD's

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There has been increasing progress in using Low Gain Avalanche Detectors (LGADs) for HEP applications to obtain improved signal-to-noise ratio and temporal resolution compared to PIN diode arrays. However, the lack of a thin entrance window is a limiting factor for deploying LGADs in some applications. For instance, UV light from noble liquid scintillation, low-energy electrons in reaction microscopes, ion products from nuclear fusion, and soft x-rays for heliophysics all require thin entrance window sensors. In 2020 IEEE NSS/MIC we proposed a novel thin entrance window LGAD device concept. We have now produced the first wafer run. We will describe the design and simulation of the new device, as well as test results. Bench test measurements on single-pixel test structures show gain of 7 for shallow absorption. We are currently bump-bonding proto-type size arrays to SLAC ASICs for full functional test.

Early Career

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