

## Characterization on the radiation hardness of USTC-1.1 LGADs

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A High-Granularity Timing Detector (HGTD), based on low gain avalanche detector (LGAD) technology, is proposed for ATLAS Phase-II upgrade. The USTC Group is involved in this project and has been developing the LGAD sensor technology. In this talk, we will report the recent results of USTC-1.1 LGAD sensors, which are designed by USTC and fabricated at IME (Institute of Microelectronics ,CAS). Various designs with different peripheral structures and gain layer implantation are realized in the production. The electrical IV/CV characterization and timing measurements with Sr-90 beta source are performed on the single-pad test structures and 5x5 arrays, both before and after neutron irradiation at JSL. The best c-factor of USTC-1.1 sensors extracted from standard CV results is  $1.85E-16 \text{ cm}^2$ . The preliminary results show that the time resolution is better than 35 ps before irradiation and better than 70 ps with the collected charge larger than 4 fC when the radiation fluence reaches  $2.5E15 \text{ cm}^{-2}$  1MeV neutron equivalent, which means the radiation hardness of USTC-1.1 LGAD sensors can potentially satisfy the specification of HGTD.

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