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## Simulation and testing results of the low gain avalanche diodes developed by IHEP and IME in China

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The ATLAS experiment High Granularity Timing Detector (HGTD) project has been approved as a part of the Large Hadrons Collider Phase-II Upgrade (HL-LHC). The Low- Gain Avalanche Detector (LGAD) with time resolution better than 50ps is the key technology to separate collisions in limited space which has been studied and researched by many institutes. This talk will present the simulation and testing results about 50um thick LGAD sensors designed by the Institute of High Energy Physics (IHEP) and fabricated by Institute of Micro Electronics (IME) of Chinese Academy of Sciences. Testing results show that the IHEP-IME sensors with different doping profiles have different breakdown voltages(VBD) and capacitance-voltage properties, which are consistent with the simulation results. Beta testing results show that the time resolution of IHEP-IME sensors are better than 40ps and the collected charges of IHEP-IME sensors are larger than 20fC before irradiation.

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