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[F05] Performance of the LGAD-based in-beam detector at HADES

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The recently emerged Low Gain Avalanche Diode (LGAD) sensor technology is optimized to measure single particles with an excellent timing precision and with a high spatial granularity. These properties, paired with a low material budget and a high radiation hardness, make LGADs viable candidates not only for 4D particle tracking, for example in high energy physics experiments and medical applications, but also for beam monitoring and reaction time determination.

For the latter applications, the High Acceptance Di-Electron Spectrometer (HADES) experiment has designed and used an in-beam detector consisting of FBK LGAD strip sensors in a high-intensity (10^8 p/s) pp production beam time in February 2022. The sensors with 96 half-strips were successfully used for beam position and macro- and micro-spill structure monitoring during the experiment. Moreover, the LGAD-based in-beam detector is foreseen to assist in particle identification by enabling a precise reaction time determination.

After introducing the LGAD-based HADES in-beam detector and the sensors it consists of, first results of its performance will be shown. In addition, future prospects and developments will be discussed.

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