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Performance of diamond detectors used for timing applications in HADES

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The report will give an overview of the results obtained in HADES heavy ion experiments with the diamond based detectors. These detectors have been used to measure the reaction time (T_0) thus have to cope with very high particle flux, above 10^6 Au ions/sec/mm². The T_0 measurement is crucial for the particle identification in the HADES spectrometer and intrinsic time resolution better than 50ps (σ) is required. The recent results from five days of such experiment will be presented.

To take full advantage of the properties of the diamond material very fast analog and digital electronics is essential. The available solutions for the fast timing applications based on NINO and HPTDC chips with intrinsic time resolution below 20ps will be discussed and a new TDC concept based on Field Programmable Arrays (FPGA) will be mentioned as well.

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