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Diamond detectors for beam monitoring, T0 determination and vertex determination for HADES and CBM experiments (CBM)

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Single-crystal Chemical Vapor Deposition (ScCVD) diamond based prototype detectors have been constructed for the high current proton, pion and heavy ion induced experiments HADES and CBM at the future FAIR facility at GSI Darmstadt. Their properties have been studied with a high current density beam (up to $2\text{--}3 \times 10^6$ particles/s/mm²) and various projectile types, protons, pions and 1.25 A GeV Au ions. The detectors have been successfully tested in the HADES spectrometer showing excellent T0 determination capability, precise vertex position and radiation hardness. Details of the design, the intrinsic properties of the detectors and their performance during test and after irradiation with such beams will be reported.

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