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CVD-Diamond for accelerator beam diagnosis applications

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CVD diamond is a wide band gap material combining the distinct thermal, optical, and electronic properties required for particle and photon detection in extreme conditions. Diamond detectors reveal extreme radiation tolerance and speed while operating at room temperature and visible light. They are capable of single-particle monitoring of primary ion beams in a wide beam intensity range from a few Hz to 10E9 ions/s. They provide single-shot sub-nanosecond time resolution, a position resolution in micrometer scale as well as excellent energy resolution approaching silicon resolution. Some possible beam diagnostics applications developed at GSI for polycrystalline and for single-crystal CVD diamond will be presented.

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