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The Micro-Vertex-Detector of the CBM-Experiment

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The Compressed Baryonic Matter Experiment (CBM) will explore the phase diagram of hadronic matter in the regime of highest baryon densities. Nuclear fireballs created in heavy ion collisions of 8-45 AGeV beam energy will be studied with numerous probes, among them open charm and light vector mesons. Reconstructing those rare probes requires a vacuum compatible micro vertex detector (MVD) with unprecedented properties. Its sensor technology has to feature a spatial resolution of $<5\mu\text{m}$, a radiation tolerance of $>10^{13} \text{ n/cm}^2$ and a time resolution of few 10 μs . The detector station must combine an active cooling of the sensors ($\sim 1\text{W/cm}^2$) with a material budget below few 0.1% radiation length.

To match those requirements, we rely on the CMOS Monolithic Active Pixel Sensors provided by the IPHC Strasbourg. The highly granular and $50\mu\text{m}$ thin sensors will be mounted on a cooling support made from CVD diamond. The readout of the sensors will be done by means of ultra-thin flex print cables. We discuss the concept of the CBM MVD and report about the status of sensor R&D and our prototyping

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