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## Diamond Pixel Detectors and 3D Diamond Devices

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**ABSTRACT:** Results from detectors of poly-crystalline chemical vapour deposited (pCVD) diamond are presented. These include the first analysis of data of the ATLAS Diamond Beam Monitor (DBM). The DBM module consists of pCVD diamond sensors instrumented with pixellated FE-I4 front-end electronics. Six diamond telescopes, each with three modules, are placed symmetrically around the ATLAS interaction point. The DBM tracking capabilities allow it to discriminate between particles coming from the interaction point and background particles passing through the ATLAS detector. Also, analysis of test beam data of pCVD DBM modules are presented. A new low threshold tuning algorithm based on noise occupancy was developed which increases the DBM module signal to noise ratio significantly. Finally first results from prototypes of a novel detector using pCVD diamond and resistive electrodes in the bulk, forming a 3D diamond device, are discussed. 3D devices based on pCVD diamond were successfully tested with test beams at CERN. The measured charge is compared to that of a strip detector mounted on the same pCVD diamond showing that the 3D device collects significantly more charge than the planar device.

**KEYWORDS:** Diamond Detectors; Radiation-hard detectors

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<sup>1</sup>See appendix A for ULIR D42a author list.