

New beam test results of 3D detectors constructed with poly-crystalline CVD diamond

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Detectors based on Chemical Vapor Deposition (CVD) diamond have been used successfully in beam conditions monitors in the highest radiation areas of the LHC. Future experiments at CERN will accumulate an order of magnitude larger fluence. As a result, an enormous effort is underway to identify detector materials that can operate after fluences of $10^{16}/\text{cm}^2$ and $10^{17}/\text{cm}^2$.

Diamond is one candidate due to its large displacement energy that enhances its radiation tolerance. Over the last 2 years the RD42 collaboration has constructed 3D CVD diamond detectors that use laser fabricated columns to enhance radiation tolerance. The cells in these detectors had a size of $50\mu\text{m} \times 50\mu\text{m}$ with columns $2.6\mu\text{m}$ in diameter. The beam test results for both un-irradiated and irradiated detectors will be presented.

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