

## Beam Test Results of the Dependence of Signal Size on Incident Particle Rate in Diamond Pixel and Pad Detectors

*Saturday 26 September 2015 19:23 (1 minute)*

We will present beam test results of the dependence of signal size on incident particle rate in charged particle detectors based on single-crystal and poly-crystalline CVD diamond. The detectors were tested over a range of particle fluxes from 2 kHz/cm<sup>2</sup> to 2 MHz/cm<sup>2</sup>. The pulse height of the sensors was measured with pad and pixel readout electronics. We will present data from the 2014 and 2015 beam tests at PSI indicating the pulse height of non-irradiated single-crystal CVD diamond sensors is stable with respect to flux, while the pulse height of irradiated single-crystal CVD diamond sensors decreases with increasing particle flux. The observed sensitivity to flux is similar in both the diamond pad sensors constructed using diamonds from the Pixel Luminosity Telescope (PLT) irradiated during its pilot run in CMS detector and in neutron irradiated diamond pad sensors from the same manufacturer irradiated to the same fluence of neutrons. The pulse height for unirradiated and irradiated poly-crystalline CVD diamond pad sensors was observed to be stable with respect to particle flux. This work is presently being extended with rates up to 20MHz/cm<sup>2</sup> in both polycrystalline and single-crystal CVD diamond pad and pixel detectors. The latest test beam results for both single-crystal and poly-crystalline CVD diamond will be shown.

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**Session Classification:** After dinner POSTER session, with drinks: (All presenters are requested/encouraged to attend their posters; All participants are requested to participate the session, with drinks!)

**Track Classification:** New materials, new technologies associated