



Contribution ID: 52

Type: **contributed paper**

Test beam results of 3D detectors constructed with single-crystal and poly-crystalline diamond

Results from prototypes of a novel detector using chemical vapour deposited (CVD) diamond and resistive electrodes in the bulk forming a 3D diamond device will be presented. The electrodes of the device were fabricated with laser assisted phase change of diamond into a combination of diamond-like-carbon, amorphous carbon and graphite. The connections to the electrodes of the 3D device were made using a photo-lithographic process. A detector system consisting of 3D devices, one based on single-crystal CVD diamond and one based on poly-crystalline CVD diamond were connected to a multi-channel readout and successfully tested in a 120 GeV proton beam at CERN proving for the first time the feasibility of the 3D diamond detector concept for particle tracking applications. Subsequent tests have refined our understanding of the charge sharing between 3D cells and the position resolution of these devices. The electrical properties and beam test results of the prototype devices will be presented.

Primary authors: Dr VENTURI, Nicola (University of Toronto); Mr TRISCHUK, William (University of Toronto)

Co-author: Prof. KAGAN, Harris (Ohio State University)

Presenter: Dr VENTURI, Nicola (University of Toronto)