

Abstract Submitted  
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**Modeling of CVD Diamond Detectors** TRAVIS TUNE, University of Tennessee Knoxville — Diamond's properties make it a prime candidate for future use in particle detectors such as at the Compact Muon Solenoid at the LHC. Diamond is radiation hard, has a low thermal conductivity, and has a large bandgap. When a fast moving particle passes through the diamond, ionization occurs, leaving a trail of charge carriers in the diamond. By applying an external electric field, these secondary particles are induced to move towards the electrodes. The movement of these charge carriers induces a current, which can be measured. This is the detection mechanism for diamond detectors. A simulation of this detection mechanism was created using GEANT, a platform developed by CERN for simulating the passage of particles through materials. The program uses Monte-Carlo methods to simulate the ionization process through the material. It is capable of tracking each secondary produced. By using this information and the Shockley-Ramo theorem, we are able to simulate the detection mechanism.

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