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## Semiconductor simulation of charge collection mechanism in CVD diamond detector

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Research mechanism of charge collection is a important factor for improving the performance of diamond particle detector. With semiconductor device simulation software GSRES, numerical simulations of transport properties of carriers in diamond are carried out. The important material properties, for instance, energy gap and ionization energies, which affect in simulation are set same to pure CVD diamond with no impurity. The physical processes of transport of carriers is numerically researched by the drift-diffusion model, and the SRH recombination mechanism in semiconductor material is the main cause of the loss of charge as simulation results show. Other parameters, as electric field intensity, lifetime of carrier, mobility and saturated velocity of carriers, which influences the charge collection rate is studied. The simulation results is compared to theoretically analysis, and shows well agreement. This numerical research method would be useful in CVD diamond detector development and improvement.

**Primary author:** YONG, Li (Northwest Institute of Nuclear Technology, Xi'an 710024, China)

**Presenter:** YONG, Li (Northwest Institute of Nuclear Technology, Xi'an 710024, China)

**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