Radiation Track Physics

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Interest in developing superior radiation detection materials has led to a drive to understand the physics of radiation tracks at a fundamental level. Radiation capture is a multi-step process, from the interaction with the initial radiation particle through the subsequent electron cascade, thermalization, and diffusive phenomenon. Ab-initio calculations are used to parameterize Monte Carlo simulations that follow each excitation in the solid to account for every charge carrier with the potential to affect the signal from a radiation detection device. Results and predictions will be shown, and predictions for new radiation detection materials will be discussed.