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Study of charge sharing effect in a GaAs:Cr-based Timepix3 detector

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Hybrid pixel semiconductor detectors find more and more applications in modern experimental setups. In particular, pixelated detectors based on GaAs:Cr sensor and Timepix3 chip are used in R&D for a state-of-the-art Transition Radiation Detector prototype at CERN. Motivation and usage aspects for GaAs:Cr-Timepix3 device in the experiment are covered in the talk. Author's contribution to the work of the research group is a study of charge collection and transportation processes in the sensor including fluorescence and so-called charge sharing effect. These are able to significantly affect both spatial and energy resolution of the system. Estimates for the effects are obtained via numerical modelling and then used to analyze the impact on the detector performance.

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