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Analysis and Characterization of CdTe Material Surface Defects

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We use atomic layer deposition (ALD) to create a layer of aluminium oxide (Al_2O_3) on single, semi-insulating CdTe crystals. The ALD process, particularly the choice of the oxygen precursor, can affect the charge and interface properties of the Al_2O_3 layer.
To study the impact of the ALD layer we used scanning laser Transient Current Technique. This provides us with data of the signal rise time and charge collection homogeneity across the detector. We investigate the impact of the ALD alumina-CdTe interface and negative fixed charge trapping using both passivated and non-passivated CdTe crystals. By comparing with the information, we obtain e.g. from optical or SEM images, or from IRM scans, we can separate the surface defects.
In this contribution we will discuss the ALD methods we use to passivate our CdTe detectors and show the results of the TCT measurements compared to SEM and IRM scans.

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