

[Luminescence Properties of CZT Crystals in the Presence of Tellurium Inclusions](#)

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CZT is a widespread material for the realization of room temperature radiation detectors. The presence of defects and in particular secondary phases, like Te inclusions, represents nowadays a limit in the realization of high resolution devices. For the development of CZT detectors, in particular for high-flux applications, is very important to understand the role of deep levels, the influence of Te inclusions on the device performance and their correlations between Te inclusions and deep levels. Using a IR microscope recently developed at IMEM, it is possible to identify the 3D position of each inclusion in the bulk and reconstruct a 3D plot describing the spacial position of every inclusion. This permits to select a sigle inclusion in the sample, to place the inclusion very close to the surface (few microns) by etching the sample and hence to study the selected inclusion. In this way it is possible to perform photoluminescence and cathodoluminescence mapping in the inclusion region and investigate the behavior of the crystal-inclusion interface. The correlation between the deep level emission acquired at the micro-scale and the presence of tellurium inclusion is discussed.