

Title: Dynamics of structural defects in CdTe-based semiconductors

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Abstract: The work was aimed at investigation of the effect of annealing on structural, electrical and optical properties of CdZnTe epitaxial substrates and CdTe-based and CdZnTe-based X-ray and gamma-ray detectors. The first part of the work is focused on investigation of structural properties of one type of second phase defects – inclusions – present in the material, which degrade the material quality. Consequent annealing experiments were aimed at reduction of these defects. In case of CdZnTe substrates, an annealing treatment leading to increase of the infrared transmittance was investigated. On the other hand, annealing experiments on the detectors of high-energetic radiation were focused on preservation of the high-resistive state. Moreover, the work contains detailed measurements of transport properties of CdTe taken directly at high temperatures.

Key words: CdTe, annealing, inclusions, detectors, defects