

Title: *Recombination centers in semiinsulating CdTe*

Author: *Jakub Zázvorka*

Department / Institute: *Institute of Physics of Charles University*

Supervisor of the master thesis: *prof. Ing. Jan Franc, DrSc., Institute of Physics of Charles University*

*Abstract: The properties of CdTe for application as a radiation detector are influenced through the presence of deep levels in the band gap. These energy levels complicate the charge collection and the detector efficiency. Contactless resistivity mapping (COREMA) represents a good option for material characterization without the necessity of metal contacts application. The time-dependent charge measurement was investigated on an adjusted apparatus in FMF Freiburg. Theoretical model of charge transport based on band bending on the sample surface was proposed and a non-exponential behavior was calculated. Using this, the resulted parameter tendencies and their connection with deep level trap or recombination center were explained. A correlation was observed between resistivity, photoconductivity and a near midgap level photoluminescence. Parameter profiles were explained using the theory of Fermi level shift relative to the near midgap level. Three deep levels were observed on samples grown at the Charles University in Prague. Their photoluminescence supports the presented theory and correlates with the resistivity and infrared photoconductivity profiles.*

*Keywords: CdTe, contactless measurement, photoconductivity, photoluminescence, deep level*