

Title: Nuclear Magnetic Resonance of Yttrium Iron Garnets with Substitutions of Cobalt and Germanium

Author: Petr Schimm

Department: Department of Low Temperature Physics

Supervisor: prof. RNDr. Helena Štěpánková, CSc., Department of Low Temperature Physics

Abstract: The work is devoted to investigation of thin films of nominally pure yttrium iron garnet and garnets containing cationic substitutions of Co, Ca and Ge. The examined samples were prepared by epitaxial growth from barium flux BaO/Ba₂O₃/BaF₂. The aim was to find whether and how the substitutions, especially cobalt, influence the spectra of ⁵⁷Fe nuclear magnetic resonance (NMR). The ⁵⁷Fe NMR spectra (in zero external magnetic field and at a temperature of 4.2K) were measured and a good resolution and high signal-to-noise ratio were reached. The weak satellite lines induced by defects, impurities and aimed substitutions were detected. The primary analysis of the spectra and their comparison were performed.

Keywords: NMR, yttrium iron garnet, defects, substitution of Co, Ge, Ca