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Effect of the hydrostatic pressure on the spectra of LLGG:Cr³⁺

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High pressure spectroscopy of materials doped with chromium is very effective tool for investigation of the radiative and non-radiative processes in the fluorescence center. In the case of LLGG, which is low field material, hydrostatic pressure changes the sequence of the first excited states $^4T_2$ and ^2E . As the result we observe the changes in the spectrum lineshape and fluorescence lifetime of the Cr³⁺ center. In this contribution we present the fluorescence spectra and fluorescence decays of LLGG:Cr³⁺ at the pressure up to 200 kbar. We have observed the blue shift of broad band $^4T_2 - ^4A_2$ / emission, related to the increase of the energy of the $^4T_2$ state with respect to the ground state, by about 10 cm⁻¹/kbar. For the upper pressure region the additional lines of the energy almost not dependent on pressure, related to $^2E - ^4T_2$ transition, have been also observed. The pressure dependence of the fluorescence lineshape and the decay have been analyzed using an adiabatic model. Used theory allows to determine to of the spin - orbit interaction and electron - phonon coupling in the formation of the first excited electronic manifold of Cr³⁺, for various crystal field strengths.