CMT 17P **DISPERSION LAWS OF SOME TWO-DIMENSIONAL CAVITY MAGNETOEXCITON-POLARITON BRANCHES**

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The energy spectrum of the 2D cavity magnetoexciton-polaritons has been investigated previously, using exact solutions for the Landau quantization of conduction electrons and heavy holes provided by the Rashba method [1]. Two lowest Landau quantization levels for electrons and three lowest Landau levels for heavy-holes, lead to the construction of the six lowest magnetoexciton states. They consist of two dipole-active, two quadrupole-active, and two forbidden quantum transitions from the ground state of the crystal to the magnetoexciton states. The interaction of the four optical-active magnetoexciton states with the cavity mode photons with a given circular polarization and with well-defined incidence direction leads to the creation of five magnetoexciton-polariton branches. The fifth order dispersion equation is examined by using numerical calculations and the second order dispersion equation in the point k=0 is solved analytically, taking into account only one dipole-active magnetoexciton state. The effective polariton mass (Fig. 1) on the lower polariton branch, the Rabi frequency and the corresponding Hopfield coefficients (Fig. 2) are determined in dependence on the magnetic field strength, the Rashba spin-orbit coupling parameters and the electron and hole g-factors [2].

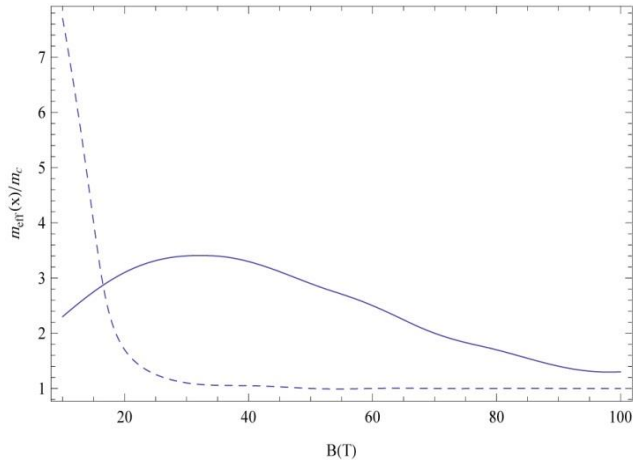

Figure 1: The dimensionless effective polariton mass $m_{\text{eff}}(0)/m_{\text{C}}$ in the point k=0 of the lower polariton branches in dependence on the magnetic field strength B in the presence (solid line) and in the absence (dashed line) of the Rashba spin-orbit coupling.

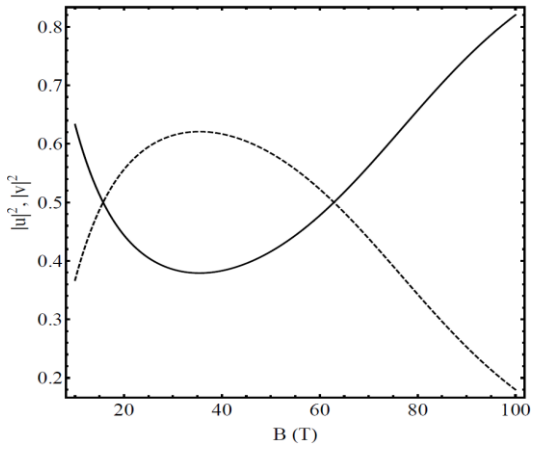

Figure 2: The dependences on the magnetic field strength B of the Hopfield coefficients square moduli $|u|^2$ (solid line) and $|v|^2$ (dashed line) in the case of magnetoexciton state F_1 interacting with the cavity photons in the presence of the Rashba spin-orbit coupling.

[1] E.I. Rashba, Fiz. Tverd. Tela (Leningrad), (1960) **2**, 1224; Sov. Phys. Solid State (1960) **2**, 1109.
[2] S.A. Moskalenko, I.V. Podlesny, E.V. Dumanov, M.A. Liberman, B.V. Novikov, Dispersion laws of the two-dimensional cavity magnetoexciton-polaritons, Journal of Nanophotonics, (2016) submitted.