g-factor of exciton-polaritons

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Exciton-polaritons, formed by strong coupling between excitons and photons in microcavities, are fascinating quasi-particles since they can form a (dynamic) Bose- Einstein condensate. Magnetic fields can strongly influence the properties of these particles, e.g. a reduction of the condensation threshold[1]. These fields acting in the polarization space do not need to have external sources, they can also occur as effective fields, e.g. caused by the TE-TM linear polarization splitting of a cavity-photon mode. Here we discuss different kinds of effective magnetic fields and their impact on the entire coupled system as well as the excitonic and photonic components of the polaritons. An important quantity is the polaritonic g-factor which connects external fields to the polarization space, and which is not explored so far in detail. We deduce the shape of the g-factor tensor and its composition, which both depend on the detuning between the exciton and photon and the momentum orientation of the polaritons.

References:

[1] V.P. Kochereshko *et al.*, arXiv:1309.6983 (2013)