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# Oscillations of the degree of circular polarization in the optical spin Hall effect

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The optical spin Hall effect appears when elastically scattered exciton polaritons couple to an effective magnetic field inside of quantum wells in semiconductor microcavities. Theory predicts an oscillation of the pseudospin of the exciton polaritons in time. Here, we present a detailed analysis of momentum space dynamics of the exciton polariton pseudospin. Compared to what is predicted by theory, we find a higher modulation of the temporal oscillations of the pseudospin. We attribute the higher modulation to additional components of the effective magnetic field which have been neglected in the foundational theory of the optical spin Hall effect. Adjusting the model by adding non-linear polariton-polariton interactions, we find a good agreement in between the experimental results and simulations.

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