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Spin-orbit twisted spin-flip waves in CdMnTe quantum wells¹ SHAHRZAD KARIMI, University of Missouri, FLORENT PEREZ, Institut des Nanosciences de Paris, CNRS/Universite Paris VI, FLORENT BABOUX, Laboratoire de Photonique et de Nanostructures, LPN/CNRS, IRENE D'AMICO, University of York, GIOVANNI VIGNALE, CARSTEN ULLRICH, University of Missouri — We present a numerical study of spin-flip wave dispersions in a spin-polarized electron gas in a dilute magnetic semiconductor heterostructure, using time-dependent density-functional response theory. The system under study is an n-doped CdMnTe quantum well with an in-plane magnetic field. Rashba and Dresselhaus spin-orbit coupling induces a wavevector-dependent spin splitting in the conduction bands. The spin waves hence travel through a spin-orbit twisted medium. We calculate the spin-wave dispersion to second order in spin-orbit coupling, including impurity scattering effects. Our results are compared with recent inelastic light scattering experiments.

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