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Topological Polaritons and Excitons in Garden Variety Systems[1]
CHARLES-EDOUARD BARDYN, TORSTEN KARZIG, GIL REFAEL, Caltech, TIM LIEW, Nanyang Technological University — Topological polaritons (aka topolaritons) present a new frontier for topological behavior in solid-state systems. They combine light and matter, which allows to probe and manipulate them in a variety of ways. They can also be made strongly interacting, due to their excitonic component. Here we present a scheme which allows to realize topolaritons in garden variety zinc-blende quantum wells. Our proposal requires a moderate magnetic field and a potential landscape which can be implemented, e.g., via surface acoustic waves or patterning. We identify indirect excitons in double quantum wells as a particularly appealing alternative for topological states in exciton-based systems. Indirect excitons are robust and long lived (with lifetimes up to milliseconds), and, therefore, provide a flexible platform for the realization, probing, and utilization of topological coupled light-matter states.

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