

Generation of Helical Topological Exciton Polaritons

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Abstract— Exciton-polaritons are half-light half-matter quasiparticles resulted from the strong coupling between excitons and photons. Exhibiting both high spatial and temporal coherence and strong inter-particle interactions, exciton polaritons serve as a unique platform for studying macroscopic quantum phenomena such as Bose-Einstein condensation and optical nonlinearities. In topological photonics, specifically, strongly coupling with excitons provides powerful toolbox for statically or actively engineer the topological properties of photonic structures. Here, we demonstrate helical topological polaritons via coupling monolayer semiconductor to a non-trivial photonic crystal, which exhibit robust, spin-momentum locked transport along the topological interface. The symmetry and topology of the coupled system will be discussed in detail.