

Abstract Submitted
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Dissipative topological insulator with fractional winding number and single edge state TONY LEE, Indiana University-Purdue University Indianapolis (IUPUI) — Photonic experiments offer an opportunity to find novel topological states. We consider a one-dimensional tight-binding model in the presence of gain and loss as well as long-range hopping. The system is described by a non-Hermitian Hamiltonian with PT symmetry and exceptional points. The unique feature of the model is that the Hamiltonian encircles an exceptional point in momentum space, leading to novel topological features. The winding number has a fractional value $1/2$ because the Brillouin zone has a periodicity of 4π instead of 2π . There is only one edge state due to the coalescence of eigenvectors. The edge state is topologically protected by a chiral symmetry but disappears when the bulk gap closes. We also discuss experimental realization with optical waveguides.

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