Unidirectional Phenomena in Optic/Acoustic PT Materials

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Parity-time (PT) symmetry is a very important concept in quantum mechanics. Due to the close similarity between the Schrödinger equation and paraxial wave equation, we can design novel PT materials in the classical optic/acoustic systems. Unlike the real modulation of refractive index in lossless photonic/phononic crystals, PT material requires complex modulation of refractive index obeying a very unique symmetry, *viz*. PT symmetry. The PT symmetry will give rise to real eigenvalues and associated exceptional points for the non-Hermitian Hamiltonian of PT systems. In this presentation, we will discuss the varied unidirectional phenomena at the exceptional points in PT systems, such as unidirectional mode conversion, one-way invisibility, EP splitting, and bifurcated FP resonances.