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Realization of a PT-symmetric dimmer in coupled semiconductor lasers

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Ever since the realization by Bender and co-workers [1] that a non-hermitian Hamiltonian can have real eigenvalues provided it is simultaneously parity (P) and time-reversal (T) symmetric, there has been an intense effort to realize experimental PT-symmetric systems. In this talk, I will talk about our recent experimental and theoretical work on creating a PT-symmetric dimmer by using bidirectionally coupled semiconductor lasers. The results will show that our system realizes a Wick-rotated PT-symmetric Hamiltonian in which the frequency detuning between the lasers and the strength of the optical coupling play the role of the complementary variables.

References:

2. C.M. Bender and S. Boettcher, Phys. Rev. Lett. 80, 5243 (1998).