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PT-Symmetry in Coupled Oscillators JAYSON ROOK, Miami University — A system may be considered PT-symmetric when, upon the action of both parity and time-reversal operators, it remains unchanged. In a system of two coupled oscillators, for instance, driving one oscillator and allowing comparable loss in the other consistutes a PT-symmetric system. For a pair of quantum oscillators, characterized by Rabi oscillations between discrete energy states, we find that the gain rate Γ should not be exactly equal to the loss rate γ to be PT-symmetric, but rather $\frac{\Gamma}{\gamma} = 1 + \frac{1}{\bar{n}}$, where $\bar{n}$ is the steady state excitation level. The $g^{(1)}$ correlation spectra under this condition show a central peak narrower than an ordinary Lorentzian, with a line-width inversely related to $\bar{n}$. Such oscillator systems come up in electromagnetically induced transparency (EIT), where electronic transition probabilities interfere, and stopped light, which utilizes EIT to store a pulse of light in an oscillator and release it at a later time.

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