

Abstract Submitted
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Experimental Observation of Brachistochrone Wave Dynamics in PT Symmetric Structures¹ JOSEPH SCHINDLER, HAMIDREZA RAMEZANI, ANG LI, MEI ZHENG, TSAMPIKOS KOTTOS, FRED ELLIS, Wesleyan University, Middletown, CT — Mutually coupled modes of a pair of active LRC circuits, one with amplification and another with an equivalent amount of attenuation, provide an experimental realization of a wide class of systems where gain and loss mechanisms break the Hermiticity while preserving parity-time (PT) symmetry. For a value γ_{PT} of the gain and loss strength parameter the eigenfrequencies undergo a spontaneous phase transition from real to complex values, while the normal modes coalesce, acquiring a definite chirality. A dramatic manifestation of PT symmetry is observed in the brachistochrone wave dynamics. Experimental findings support the theoretical prediction of arbitrarily small energy transfer times between the LRC elements of the circuit. We envision that realization of such design strategies can have applications in telecommunications and metamaterial structures.

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Joseph Schindler
Wesleyan University, Middletown, CT

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