

Abstract Submitted
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Taming the Exceptional Points of Parity-Time Symmetric Acoustics MARC DUBOIS, CHENGZHI SHI, Univ of California - Berkeley, YUN CHEN, LEI CHENG, Fudan University, HAMIDREZA RAMEZANI, YUAN WANG, XIANG ZHANG, Univ of California - Berkeley — Parity-time (PT) symmetric concept and development lead to a wide range of applications including coherent perfect absorbers, single mode lasers, unidirectional cloaking and sensing, and optical isolators. These new applications and devices emerge from the existence of a phase transition in PT symmetric complex-valued potential obtained by balancing gain and loss materials. However, the systematic extension of such devices is adjourned by the key challenge in the management of the complex scattering process within the structure in order to engineer PT phase and exceptional points. Here, based on active acoustic elements, we experimentally demonstrate the simultaneous control of complex-valued potentials and multiple interference inside the structure at any given frequency. This method broadens the scope of applications for PT symmetric devices in many fields including optics, microwaves, electronics, which are crucial for sensing, imaging, cloaking, lasing, absorbing, etc.

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