

Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Probing non-Hermitian physics with an imaginary potential JIANMING WEN, Yale University, YANHONG XIAO, PENG PENG, WANXIA CAO, CE SHEN, WEIZHI QU, Fudan University, LIANG JIANG, Yale University — We report the first experimental realization of anti-parity-time (anti-PT) symmetry [1], a counterpart of conventional PT symmetry [2], in a warm EIT atomic-vapor cell. Using rapid coherence transport via flying atoms, we observe not only essential features of anti-PT symmetry with an unprecedented precision on PT-phase transition, but also introduce a novel dissipative yet coherence coupling mechanism which resembles a pure imaginary potential. With the setting, we further demonstrate some novel phenomena including light refractionless (or unit-refraction) propagation, non-local interference between two spatially separated light waves, and anti-PT-assisted four-wave mixing. [1] P. Peng, W. Cao, C. Shen, W. Qu, J. Wen, L. Jiang, and Y. Xiao, *Nature Physics*, DOI: 10.1038/NPHYS3842 (2016). [2] L. Chang, X. Jiang, S. Hua, C. Yang, J. Wen, L. Jiang, G. Li, G. Wang, and M. Xiao, *Nature Photonics* **8**, 524-529 (2014).

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Date submitted: 08 Nov 2016

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