

Abstract Submitted
for the DAMOP18 Meeting of
The American Physical Society

The relations between quantum Zeno/anti-Zeno effect and parity-time symmetric Hamiltonian JIAMING LI, ZHAO WANG, LE LUO, School of Physics and Astronomy and TianQin Research Center for Gravitational Physics, Sun Yat-sen University, YOGESH NARAYAN JOGLEKAR, Department of Physics, Indiana University Purdue University Indianapolis — Recently dissipative trapped atoms have been used to realize parity-time (PT) symmetric non-Hermitian Hamiltonians ^[1]. Such systems not only exhibit novel symmetry breaking properties, but also indicate its subtle relation with the measurement effects in quantum decay processes, known as quantum Zeno or anti-Zeno effect (QZE/AZE). In this talk, we will present the experimental results of simulating PT-symmetric Hamiltonians with dissipative ultracold ⁶Li atoms in various cases, including static dissipation, Floquet dissipation, and Floquet coupling. Our observation shows that static and Floquet dissipation relate to the continuous QZE and the pulsed QZE, respectively. We then compare the similarity between the Floquet dissipation case and the previous QZE/AZE observed in the lattice tunneling experiments ^[2]. Our findings enable PT-symmetric Hamiltonian to be a useful tool for analyzing QZE/AZE, particularly for their counterparts in the weak dissipation or measurement regimes. [1] J. Li et al. arXiv:1608.05061 [2]M.C. Fischer et al. Phys. Rev. Lett. 87, 040402, 2001

Jiaming Li
Sun Yat-sen University

Date submitted: 15 Mar 2018

Electronic form version 1.4