

Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Bound states and perfect transmission scattering states in \mathcal{PT} -symmetric open quantum systems¹ SAVANNAH GARMON, University of Tokyo, MARIAGIOVANNA GIANFREDA, Università del Salento, NAOMICHI HATANO, University of Tokyo — We study the point spectrum and transmission scattering spectrum in \mathcal{PT} -symmetric open quantum systems containing balanced regions of energy amplification and attenuation, using tight-binding chains with matching sink and source sites as prototype models. For a given system geometry, we write the boundary conditions that permit scattering state and bound state solutions with wave functions that likewise satisfy \mathcal{PT} symmetry; we further demonstrate the \mathcal{PT} -symmetric scattering states give rise to perfect transmission through the scattering region. We also discuss bound states in continuum and other spectral effects that may be discovered in \mathcal{PT} -symmetric open quantum systems. Finally we discuss the potential for experimental realization of our models in systems containing whispering gallery mode resonators with balanced loss and gain.

¹S. G. acknowledges support from the Japan Society for the Promotion of Science

Savannah Garmon
University of Tokyo

Date submitted: 15 Nov 2013

Electronic form version 1.4