

Quantum systems with complex energy spectra

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Dynamical aspects of quantum systems are often controlled by external forces. Two classes of toy models of such a mechanism will be presented. The first one will be represented by a non-Hermitian equilateral q -pointed star-shaped quantum graph in which the effect of the external forces is mimicked by the rotation-symmetric complex Robin boundary conditions at the outer ends of the wedges. In our second class of models we consider more complicated “thick” graphs *alias* thin wave guides in more dimensions while we simplify the simulation of the effect of external forces. We will pay attention to the dynamical regime in which the discrete spectrum ceases to be real. In certain special cases, for illustration, closed asymptotic-expansion formulae will be derived.

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