This is a review submitted to Mathematical Reviews/MathSciNet.

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Title: On the observability and asymmetry of adiabatic state flips generated by exceptional points.

MR Number: MR2844994

Primary classification: 81S22

Secondary classification(s): 81Q12 81Q70

Review text:

The book [14] and, in particular, its chapter 10 may be consulted to settle the scene: The (unknown) Hamiltonian which describes an open - scattering-admitting - abstract quantum system is replaced by the "equivalent" Feshbach's effective-Hamiltonian H (i.e., a projection on a subspace, assumed known and, naturally, manifestly non-Hermitian and admitting complex eigenvalues). In the second step one admits that $H = H(\vec{\lambda})$ varies with its parameters and, "slowly", with time, $\vec{\lambda} = \vec{\lambda}(t)$. It is popular to make calculations using instantaneous, "adiabatic" eigenbases. In the paper, the authors consider the specific scenario (called "state-flip") in which the parameters $\vec{\lambda}(t)$ encircle a branch point of the hypersurface of the eigenstates (so that a ket-vector in consideration does not return to its initial value). In this setting, the main result of the paper is that the interplay between the non-Hermiticity and non-adiabatic factors may mar the observability of the flip effect. A useful recommended complementary reading is paper [19] which may help the readers to understand the idea better since it describes the "closed loop of $\vec{\lambda}(t)$" flipping paradox in a model which is solved, exactly, in terms of Bessel functions.