

What is the semiclassical limit of non-Hermitian time evolution?

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This is joint work with E-M Graefe. We investigate solutions of the time dependent Schrödinger equation with a non-Hermitian Hamiltonian and derive a non-Hermitian extension of the Ehrenfest Theorem. By choosing Gaussian coherent states as initial conditions we find that the classical dynamics which emerges is no longer Hamiltonian, but has a Hamiltonian and a gradient part which involves a time dependent metric on phase space. We discuss the complex symplectic geometry underlying this dynamics and relate it to Kähler structures. We then extend the results to more general complex WKB functions where the same dynamics governs the motion of local minima of the imaginary part of complex phase functions.