A new semiclassical propagator for non-Hermitian quantum systems

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Gaussian states form an over-complete basis of the Hilbert space of square integrable functions. This fact can be used to devise propagation schemes for arbitrary quantum states expanded into Gaussians. One very successful approach for Hermitian systems is Heller's *hybrid dynamics*. In this method the dynamics of the individual Gaussian components are approximated by the semiclassical dynamics valid for short times, and the propagated state is re-expanded into Gaussians at short time intervals. In recent years the time-evolution of Gaussian wave packets in the short-time limit has been extended to non-Hermitian systems. This offers the opportunity to devise analogous numerical propagation schemes for the dynamics of non-Hermitian quantum systems, which will be discussed in the present talk. We will give a brief overview over Heller's hybrid method in the Hermitian case, and the short time dynamics of Gaussian wave packets generated by non-Hermitian Hamiltonians. Then we will present examples of the new numerical method in non-Hermitian systems.