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# Quantum Dynamics with Time-dependent NQS

One of the main challenges in solving quantum many-body (MB) problems is the exponential growth of the Hilbert space with system size.

In this regard, a new promising alternative are neural-network quantum states (NQS).
This approach leverages the parameterization of the wave function with neural-network architectures.
Compared to other variational methods, NQS are highly scalable with systemsize and can naturally capture complex behaviours. #nonlinearities and nonlocal correlations within the system.

Here, we present proof-of-principle time-dependent NQS simulations, involving coherent states of single-particle models, to illustrate the ability of this approach to effectively capture key aspects of quantum dynamics in the continuum.
These results pave the way to more complex MB systems with promising applications in nuclear physics, ultracold atoms, and quantum simulations.

## AI keywords

Neural Quantum States; reinforcement learning; real-time dynamics;

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