

Optimal preparation of quantum states on an atom-chip device

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Atom chips provide compact and robust platforms towards the implementation of practical quantum technologies. A quick and faithful preparation of arbitrary input states for these devices is crucial but represents a challenging experimental task. This is especially difficult when the dynamical evolution is noisy and unavoidable setup imperfections have to be considered. Here, we experimentally prepare with very high fidelity nontrivial superpositions of internal states of a rubidium Bose-Einstein condensate realized on an atom chip.

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