Fast quantum gas formation via electromagnetically induced transparency cooling

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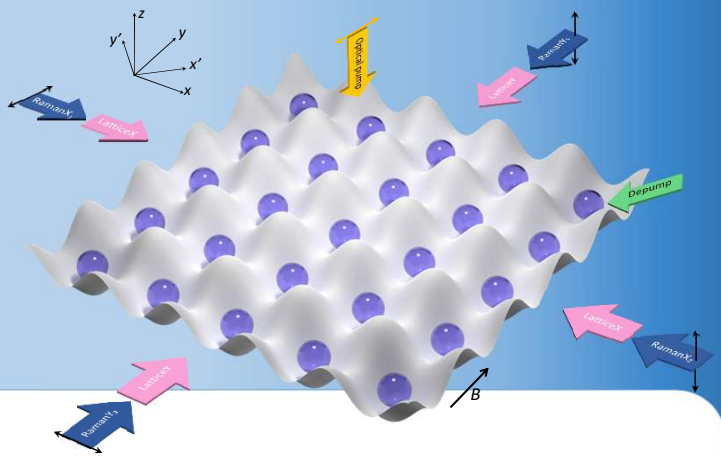
ABSTRACT

Ultracold quantum gases play a pivotal role as essential states of matter in many-body physics, quantum sensing, and quantum simulation. However, the construction of quantum gas requires time-consuming evaporative cooling in bulk ensembles, which takes generally from seconds to minutes. Here, we report the creation of a 85Rb quantum gas by simply cooling individual atoms pinned in a three-dimensional optical lattice using electromagnetically induced transparency and adiabatic expansion. We demonstrate the generation of quantum gas through 10 ms time-scale cooling. This significant reduction in preparation time holds great potential for enhancing quantum gas applications.



Will amend this poster after submission

REFERENCE

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