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Two-atom Interferometry

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The two-atom interferometer introduces two different yet indistinguishable alternatives for randomly paired atoms to create a joint atom-detection event. The superposition of two-atom amplitudes yields two-atom interference with peculiar features which outshine the classic atom interferometer: (1) two-atom interference is still observable when the time delay of the interferometer is greater than the coherence time of the atom beam and (2) two-atom interference may eliminate phase noises, including background, variation, turbulence, and Raman laser induced phase noises, thereby allowing for higher sensitivity and stability sensing than is achievable by classic atom interferometers. These features are crucial in high sensitivity-accuracy acceleration and rotation measurements. The presented concept and mechanism of two-atom interference can be adapted to other matter-wave interferometers, such as two-neutron interferometer and two-electron interferometer.

Is this abstract from experiment?

No

Name of experiment and experimental site

N/A

Is the speaker for that presentation defined?

Yes

Details

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Internet talk

Yes

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