Pulsed three light grating interferometer with Bose-Einstein condensate

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Abstract

We demonstrate an atom interferometer for a highly coherent ensemble of about 10^6 sodium atoms from a Bose-Einstein condensate released from a magnetic trap. The interferometer is based on three pulses of a horizontal standing light wave, applied to the falling atoms after equal periods of time. Despite the small size of the interferometer (≈ 0.5 mm), there is complete separation of the interfering arms (≈ 0.2 mm) and very high contrast of the interference fringes.