

Matter-Wave Interference in Multicomponent Spinor Bose-Einstein Condensate

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We report an experimental observation of matter-wave interference of spinor states in the presence of a homogeneous magnetic field in an expanding ^{87}Rb $F = 2$ anti-ferromagnetic Bose-Einstein condensate. Five hfs components of this state are populated by forced Majorana transitions. The interference pattern is created during measurement of atomic density distributions with a Stern-Gerlach imaging method. The resulting matter-wave interference patterns are anticorrelated and mimic spontaneous pattern formation in an antiferromagnetic quantum gases observed in different labs. Our analysis demonstrates that the matter-wave interference may occur in a large range of specific experimental conditions and result in complex density distributions of spinor condensates.

