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Rotary echo tests of coherence in Rydberg-atom excitation[1]
KELLY COOPER YOUNGE, GEORG RAITHEL, University of Michigan — Rotary echoes are employed to study excitation dynamics in many-body Rydberg systems. In this method, a phase reversal of a narrow-band excitation field, applied at a variable time during the excitation pulse, results in echo signals the visibility of which reveal the degree of coherence of the excitation process. Rotary echoes are measured for several $n\mathrm{D}_{5/2}$ Rydberg levels of rubidium with principal quantum numbers near $n = 43$, where the strength of electrostatic Rydberg-atom interactions is modulated by a Förster resonance. The Rydberg-atom interactions are shown to diminish the echo visibility, in agreement with recent theoretical work. The equivalence of echo signals with spectroscopic data is demonstrated.

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