

Abstract Submitted  
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**Dynamics of spinor condensates near point-group symmetric ground states** GIL REFAEL, RYAN BARNETT, Caltech, DANIEL PODOLSKY, University of Toronto — The mean-field ground state of spin- $S$  BEC's often exhibits a high degree of symmetry, which only becomes apparent when considering the  $2S$  reciprocal spin-states: coherent spin-states orthogonal to the ground state. Our presentation will concentrate on a description of the dynamics of spinor-condensates using these reciprocal states. First, we will present the resulting hydrodynamic Euler equations, which generalize Mermin-Ho relations to higher spin. Second, we will use the reciprocal states and their hidden point-group symmetry to construct the Goldstone and optical spin-wave modes of the spinor condensates. Finally, we will present a mapping between the spin-wave modes, and the wave functions of electrons in atoms, where the spherical symmetry is degraded by a crystal field.

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