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Exploring the correspondence principle with spinor condensates: from quantum Bloch oscillations to classical Bogoliubov excitations¹ REINHOLD WALSER, University of Ulm, Abteilung Quantenphysik, D-89081, Germany, CARSTEN WEIß, OLIVER CRASSER, WOLFGANG SCHLEICH — By tuning the relative strength between single and two-body energies in a spinorial F=1 Bose-Einstein condensate (e.g. ⁸⁷Rb), we can effectively control the dynamics of the macroscopic Fock-state [1,2,3]. We will study the static as well as dynamic aspects of this few mode quantum system and illustrate the "classical" as well as quantum aspects of this system, which can be realized in deep optical lattices.

[1] M-S. Chang *et al.*, Coherent spinor dynamics in a spin-1 Bose-Einstein condensate, Nature Phys., **1**, 111 (2005).

[2] J. Kronjäger *et al.*, Evolution of a spinor condensate: coherent dynamics, dephasing and revivals, Phys. Rev. A, **72**, 063619 (2005).

[3] A. Widera *et al.*, Precision measurements of spin-dependent interaction strength for spin-1 and spin-2 ⁸⁷Rb atoms, NJP, **8**, 152, (2006).

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