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Adiabatic momentum space treatment of a spin-orbit coupled BEC SU-JU WANG, Department of Physics, Purdue University, CHRIS GREENE, Department of Physics, Purdue University, Department of Physics and JILA, University of Colorado — By dressing the atomic spin states with Raman laser fields, experimentalists can create spin-orbit coupled Bose-Einstein condensates (BECs) by tuning controllable parameters in an ultracold atomic system [1]. In the presence of spin-orbit coupling, we study the spin dynamics of a harmonically-trapped spinor BEC that can be driven by non-adiabatic Landau-Zener transitions occurring at avoided crossings between the bands.

[1] Y. J. Lin, K. Jimenez-Garcia and I.B. Spielman, Nature, 471, 83 (2011).

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