## Abstract Submitted for the DAMOP14 Meeting of The American Physical Society

Controlling the Phase of Imprinted Spin Textures in Spinor BECs JUSTIN T. SCHULTZ, AZURE HANSEN, NICHOLAS P. BIGELOW, University of Rochester — Multi-photon Raman processes are used to make many complex topological spin textures in spinor BECs such as coreless vortices, non-Abelian vortices, skyrmions, and spin monopoles. Understanding this process is important in controllably writing spin textures into the condensate. We derive analytic expressions for the phases of the states for a two-photon Raman interaction and show that for spatially-dependent Rabi frequencies, time-dependent singularities in these phases lead to density modulations termed a "Raman Fingerprint" for diabatic pulses [1]. When the two-photon detuning is not zero, an additional phase adjusts the locations of the phase singularities, therefore, allowing control over the size of the imprinted features.

[1] L.S. Leslie, et al. Laser Physics 19, 593 (2009).

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Date submitted: 30 Jan 2014 Electronic form version 1.4