Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Soft-pulse refocusing in the presence of Markovian dephasing GREGORY D. QUIROZ, USC, LEONID P. PRYADKO, UCR — We consider the effect of Markovian decoherence on the performance of refocusing sequences. This is relevant if dynamical decoupling is to be concatenated with quantum error correcting codes as the first stage of decoherence protection. The basic effect is that an asymmetric decoherence can cause a change in the direction of polarization of a quantum system. For example, dephasing of a single qubit reduces transverse components of the spin polarization vector, thus shifting it towards the z axis. In this work we construct perturbation expansions of effective decoherence operators for generic shaped pulses, and for several sequences of π- and $\pi/2$-pulses. While in general the performance of soft pulses is worse that that of the ideal δ-pulses, the detrimental effect of dephasing can be reduced by pulse shaping.

Gregory D. Quiroz
USC

Date submitted: 21 Nov 2008 Electronic form version 1.4