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**Jeremy Marzuola** and **Sarah Raynor\*** ([raynorsg@wfu.edu](mailto:raynorsg@wfu.edu)), P.O. Box 7388, Department of Mathematics, Wake Forest University, Winston Salem, NC 27109, and **Gideon Simpson**. *A system of ODEs for a Perturbation of a Minimal Mass Soliton.*

We study soliton solutions to the nonlinear Schrödinger equation (NLS) with a saturated nonlinearity. NLS with such a nonlinearity is known to possess a minimal mass soliton. We consider a small perturbation of a minimal mass soliton and identify a system of ODEs extending the work of Comech and Pelinovsky, which models the behavior of the perturbation for short times. We then provide numerical evidence that under this system of ODEs there are two possible dynamical outcomes, in accord with the conclusions of Pelinovsky, Afanasjev, and Kivshar. Generically, initial data which supports a soliton structure appears to oscillate, with oscillations centered on a stable soliton. For initial data which is expected to disperse, the finite dimensional dynamics initially follow the unstable portion of the soliton curve. (Received January 25, 2010)