Analytically solvable pulses for spin qubit rotations
SOPHIA ECONOMOU, Naval Research Lab — The hyperbolic se- 
cant pulse is a well known pulse shape for which the time dependent Schrodinger equation of a two-level system is analytically solvable. It has in the past been proposed [1] for optical spin rotations in quantum dots, and used experimentally to that end [2]. In this talk, a family of pulses will be introduced which can be viewed as the generalization of the sech pulse. These pulses may have skewed temporal profiles and frequency modulation (“chirping”). I will present results for the fidelity of spin rotations using some of these pulses and show that in the case of “Raman-type” control, where an auxiliary excited state is used, it can be advantageous to replace the usual $2\pi$ sech pulse.