Pairing of Opposite-Spin Fermions in the BCS-BEC Crossover Regime\textsuperscript{1} JAVIER VON STECHER, CHRIS H. GREENE, Deparment of Physics and JILA - University of Colorado at Boulder, Boulder, CO 80309-0440, USA — We consider a pair of opposite spin fermions that interact with a degenerate Fermi gas, which is trapped in a spherical oscillator potential. We magnetically tune the S-wave scattering length in the negative region through a Feshbach resonance, producing an attractive interaction between fermions. We use the Hartree-Fock approximation to study the degenerate Fermi gas and pseudopotentials to mimic the interaction between the pair of fermions in a trap and a degenerate Fermi gas in the mean field approximation. We implement hyperspherical coordinates and a model potential for the pair interaction to study the spectrum and wavefunctions of the pair as a function of the magnetic field. In particular, we consider the strongly interacting regime, close to the collapse of the Fermi gas.

\textsuperscript{1}This work has been supported by NSF