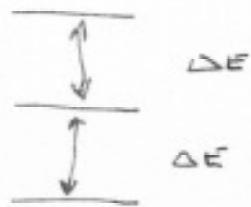


HOMEWORK Due 9/25

To produce Bose-Einstein condensates, atoms are selectively expelled from a magnetic trap by driving RF transitions between magnetic sublevels. Consider a 3-level system (i.e. spin-1) with equally spaced levels.



- 1) Write the 3×3 matrix that must be diagonalized to find the dressed states.
- 2) Find the dressed state energies.
- 3) In a linear-gradient magnetic field, $B = \beta x$, the energy of the states will vary as $E \propto m\beta x$, where m is the magnetic qu. no.
Sketch the dressed state energies as a function of position.
- 4) Is the spin-flip transition an adiabatic or non-adiabatic process?