

Spin One Probabilities

Choose the Spin-1 case under the design menu. Set up an experiment for successive measurement of spin projections. The first analyzer will prepare the atom in a state $|\psi\rangle$. The second analyzer will then project this state vector onto one of the eigenstates corresponding to the spin projection along the axis of the second analyzer. If we call this eigenstate $|\phi\rangle$, then the probability that the atom is detected in that channel is $|\langle\phi|\psi\rangle|^2$. Your experiment will allow you to measure this probability. Remember that this is the probability that an atom leaving the first analyzer also makes it through the second analyzer to the appropriate detector, and not the total probability for getting from the oven to the detector. Fill in the experimental table on the worksheet with your measured values corresponding to all three choices of axes for each analyzer. Use the expressions for the spin eigenkets on the spin reference sheet to calculate all these same probabilities and fill in the theory table.