

Chem. 540
Instructor: Nancy Makri

PROBLEM BASICS 4

Perhaps surprisingly, large interference effects can occur even when one of the interfering possibilities is not very probable. Consider a two-slit experiment where one hole is sufficiently blocked so that the probability of getting through is reduced by a factor of 100. Show that the probability of finding the electron at a maximum in the now reduced interference pattern is still 50% higher than at a minimum. (Consider a maximum and a minimum near the center of the screen, i.e., take a value of x equidistant from the two holes.) Use Dirac notation.

Hint: Take x approximately equidistant from the two holes, so $|\langle x|1\rangle| = |\langle x|2\rangle|$.