Group Activity 15

Due: In class, October 21st

1. Suppose we have a resonance where the entrance and exit widths are equal and their sum is equal to the total width ($\Gamma_{entr} = \Gamma_{exit} = \frac{\Gamma_{tot}}{2}$). Take the entrance and exit widths to be 0.5keV and the resonance energy to be 1000keV. Relative to the cross section at the resonance energy, what will the cross section be at a center of mass energy of 999keV? What about at 995keV?

2. What are the natural parity states in ¹⁸Ne that can be populated in ¹⁴O(α ,p) for $l = 0,1,2,\cdots$?

3. Based on systematics for α partial widths and the Porter-Thomas distribution, what is the probability of a 13 MeV state in a mass 28 nucleus having a width at the Wigner limit?