

HW5

1. Calculate the interval at which elution from a ^{99}Mo -based $^{99\text{m}}\text{Tc}$ generator should be performed in order to maximize the yield of $^{99\text{m}}\text{Tc}$ per elution, assuming perfect elution efficiency. What will the total yield of $^{99\text{m}}\text{Tc}$ be as a percentage of the starting amount of ^{99}Mo when this elution interval is used indefinitely? How could the recovery of $^{99\text{m}}\text{Tc}$ be made more efficient?
2. Two 511 keV photon detectors are spaced apart from each other at a distance of one meter. With what time resolution would detection events have to be registered in order to distinguish accurately the origins of positron annihilation events between the two detectors with a spatial resolution of 1 cm?