**Counting Instructions:**

Call James Bevins at 8657558090 with any issues. There are three sets of information to aid in the counting:

1. General data acquisition information (this one)
2. Approximate count plan
3. Gammas of interest to each foil

Each foil is numbered by the convention Elem#, where elem is the element of the foil, and # is the run number. For example, an aluminum foil from the 1st irradiation would be Al1. The run number is useful for identifying the next foil in the count plan, the approximate count time, and the save directory; the element is useful for referencing which gammas are of interest.

The foil data acquisition steps are

1. Verify that the number of desired counts have been achieved in each peak from the listing of important gammas. This is generally 10k counts.
2. Click the red stop button on Gamma Vision
3. Save the ASCI SPE using the naming convention Elem
4. \_Pos\_Date\_Time in the folder C:/users/Bevins/33MeVTa\_25Apr/<RunNum>. For example, an aluminum foil from run 2 counted on shelf 1 on the 22nd at 1325 would be saved in the C:/users/Bevins/33MeVTa\_25Apr/2 folder as Al\_1\_22Apr17\_1325.
5. Click the Σ button on the right side of the toolbar. Close all of the popups until only the detector 2 window is open.
6. Clear the buffer (on toolbar two buttons right of the stop button.)
7. Reference the count plan to see which foil is next; place that foil in the position indicated from the count plan. Ensure foil is centered in the cutout. NOTE: The HEU foil will need the smaller cutout that is to the left of the detector. Center the HEU foils as much as possible in the cutout.
8. Ensure shelf is pushed to the back right if there is play in its positioning.
9. Close the lid. Do not slam it!
10. Load the calibration file corresponding to the shelf position being used. In GammaVision, click Calibration->Recall. The files are located in C:/users/Bevins/33MeVTa\_25Apr/Calibration with the naming convention of CalibData\_Pos.
11. Click Go on Gamma Vision

For the HEU foil, step 11 from above is replaced with:

1. Click services, Job Control, and load the job control file located at C:/users/Bevins/33MeVTa\_25Apr/Data/Day1. This should automatically dump a spectrum every 4 hours.

Each foil follows the naming convention Isotope(reaction)Position. The position is the shelf that the foil should be counted at. The count time are approximate and may vary significantly.

**Count Plan 1:** Cave01 Foils (Assuming 15 min run time, 10 uA, 75 sec btwn foils)

﻿

27Al(n,p)b18 1 min

27Al(n,p)a18 -

27Al(n,a)a18 1 min

27Al(n,p)b10 1 min

27Al(n,p)b5 1 min

27Al(n,p)b 1 min

27Al(n,p)a -

27Al(n,a)a 1 min

115In(n,n')18 -

115In(n,g)18 1 min

115In(n,n') -

115In(n,g) 1 min

197Au(n,2n)18 -

197Au(n,g)18 554 min (This will be much shorter; underestimating the low energy component)

197Au(n,2n) -

197Au(n,g) 25 min (This will be much shorter; underestimating the low energy component)

58Ni(n,2n)18 -

58Ni(n,p)18 3 min

58Ni(n,2n) -

58Ni(n,p) 1 min

90Zr(n,2n)18 -

90Zr(n,2n) 1 min

DU18

DU5

DU1

**Count Plan 2:** Cave02 Foils (Assuming 4 hr run time, 10 uA, and 75 sec btwn foils):

27Al(n,p)         -

27Al(n,a)         22 min

115In(n,n')       -

115In(n,g)        37 min

58Ni(n,2n)       -

58Ni(n,p)        281 min

90Zr(n,2n)        60 min

197Au(n,2n)     -

197Au(n,g)      1792 min (This will be much shorter; underestimating the low energy component)

**Count Plan 3:** ETAFoils (Assuming 24 hr run time, 10 uA, and 75 sec btwn foils):

27Al(n,p)1        -

27Al(n,a) 1       30 min

115In(n,n')1      -

115In(n,g)1      10 min

197Au(n,2n)1   -

197Au(n,g)1     80 min

90Zr(n,2n)1      45 min

58Ni(n,2n)1      -

58Ni(n,p)1       135 min

HEU\*                7 days \* TBD Based on dead time. Options are 1, 5, 10 cm, whichever is the closest and gets to < 10% dead time.

**Gammas of Interest:**

Al (10k counts in all):

1. 843.76 keV
2. 1014.52 keV
3. 1368.63 keV
4. 2754.007

Au (10k counts in all):

1. 355.7
2. 411.802

In (10k counts in all):

1. 190.27
2. 336.241
3. 1293.56
4. 2112.29

Ni (10k counts in all):

1. 810.76
2. 1377.63
3. 1919.52

Zr (10k counts in all):

1. 909.15

DU/HEU (Job control file):

1. 91.105 (Nd147)
2. 103.1801 (Sm153)
3. 167.75 (Pm151)
4. 245.40 (Ag111)
5. 275.21 (Pm151)
6. 340.08 (Pm151)
7. 342.13 (Ag111)
8. 529.872 (I133)
9. 531.016 (Nd147)
10. 537.261 (Ba140)
11. 617.517 (Ag112)
12. 724.192 (Zr95)
13. 743.36 (Zr97)
14. 756.725 (Zr95)
15. 875.329 (Ba140)