4.4 MeV excited carbon

Assuming 20 μA current

HMS Monte Carlo

```
1000000      Monte-Carlo trials
      1       Spectrometer (1=HMS, 2=SHMS, 3=..)
 2206.3      Spectrometer momentum (in MeV/c)
   10.5      Spectrometer angle (in degrees)
  -15.0      M.C. DP/P  down limit
   15.0      M.C. DP/P  up   limit
  -90.0      M.C. Theta down limit (mr)
   90.0      M.C. Theta down limit (mr)
  -50.0      M.C. Phi   down limit (mr)
   50.0      M.C. Phi   down limit (mr)
   0.0       Horiz beam spot size in cm (Full width of +/- 3 sigma)
   0.0       Vert  beam spot size in cm (Full width of +/- 3 sigma)
   0.07715   Length of target (Full width, cm)
   0.0        Raster half-width x (cm)
   0.0        Raster half-width y (cm)
   100.0     DP/P  reconstruction cut (half width in % )
   100.0     Theta reconstruction cut (half width in mr)
   100.0     Phi   reconstruction cut (half width in mr)
   100.0     ZTGT  reconstruction cut (Half width in cm)
   18.954    one radiation length of target material (in cm)
   0.0        Beam x offset (cm)  +x = beam left
   0.0       Beam y offset (cm)  +y = up
   0.0        Target z offset (cm)+z = downstream
   0.0        Spectrometer y offset (cm)
   0.0        Spectrometer z offset (cm)
   0.0        Spectrometer xp offset (mr)
   0.0        Spectrometer yp offset (mr)
   0 particle identification :e=0, p=1, d=2, pi=3, ka=4
   1 flag for multiple scattering
   1 flag for wire chamber smearing
   0 flag for storing all events (including failed events with stop_id > 0)
   2217      Beam energy for elastics (MeV)
```

Use sieve = true

HMS plots are here:

https://userweb.jlab.org/~hszumila/hallc/rates/hms_carbon_excited.pdf

SHMS Monte Carlo

```
1000000      Monte-Carlo trials
      2       Spectrometer (1=HMS, 2=SHMS, 3=..)
 2206.3      Spectrometer momentum (in MeV/c)
    7.5      Spectrometer angle (in degrees)
  -15.0      M.C. DP/P  down limit
   30.0      M.C. DP/P  up   limit
  -55.0      M.C. Theta down limit (mr)
   55.0      M.C. Theta down limit (mr)
  -50.0      M.C. Phi   down limit (mr)
   50.0      M.C. Phi   down limit (mr)
   0.0       Horiz beam spot size in cm (Full width of +/- 3 sigma)
   0.0       Vert  beam spot size in cm (Full width of +/- 3 sigma)
   0.07715   Length of target (Full width, cm)
   0.0        Raster half-width x (cm)
   0.0        Raster half-width y (cm)
   100.0     DP/P  reconstruction cut (half width in % )
   100.0     Theta reconstruction cut (half width in mr)
   100.0     Phi   reconstruction cut (half width in mr)
   100.0     ZTGT  reconstruction cut (Half width in cm)
   18.954    one radiation length of target material (in cm)
   0.0        Beam x offset (cm)  +x = beam left
   0.0       Beam y offset (cm)  +y = up
   0.0        Target z offset (cm)+z = downstream
   0.0        Spectrometer y offset (cm)
   0.0        Spectrometer z offset (cm)
   0.0        Spectrometer xp offset (mr)
   0.0        Spectrometer yp offset (mr)
   0 particle identification :e=0, p=1, d=2, pi=3, ka=4
   1 flag for multiple scattering
   1 flag for wire chamber smearing
   0 flag for storing all events (including failed events with stop_id > 0)
   2217      Beam energy for elastics (MeV)
```

Use sieve = true, vacuum true

SHMS plots are here:

https://userweb.jlab.org/~hszumila/hallc/rates/shms_carbon_excited.pdf