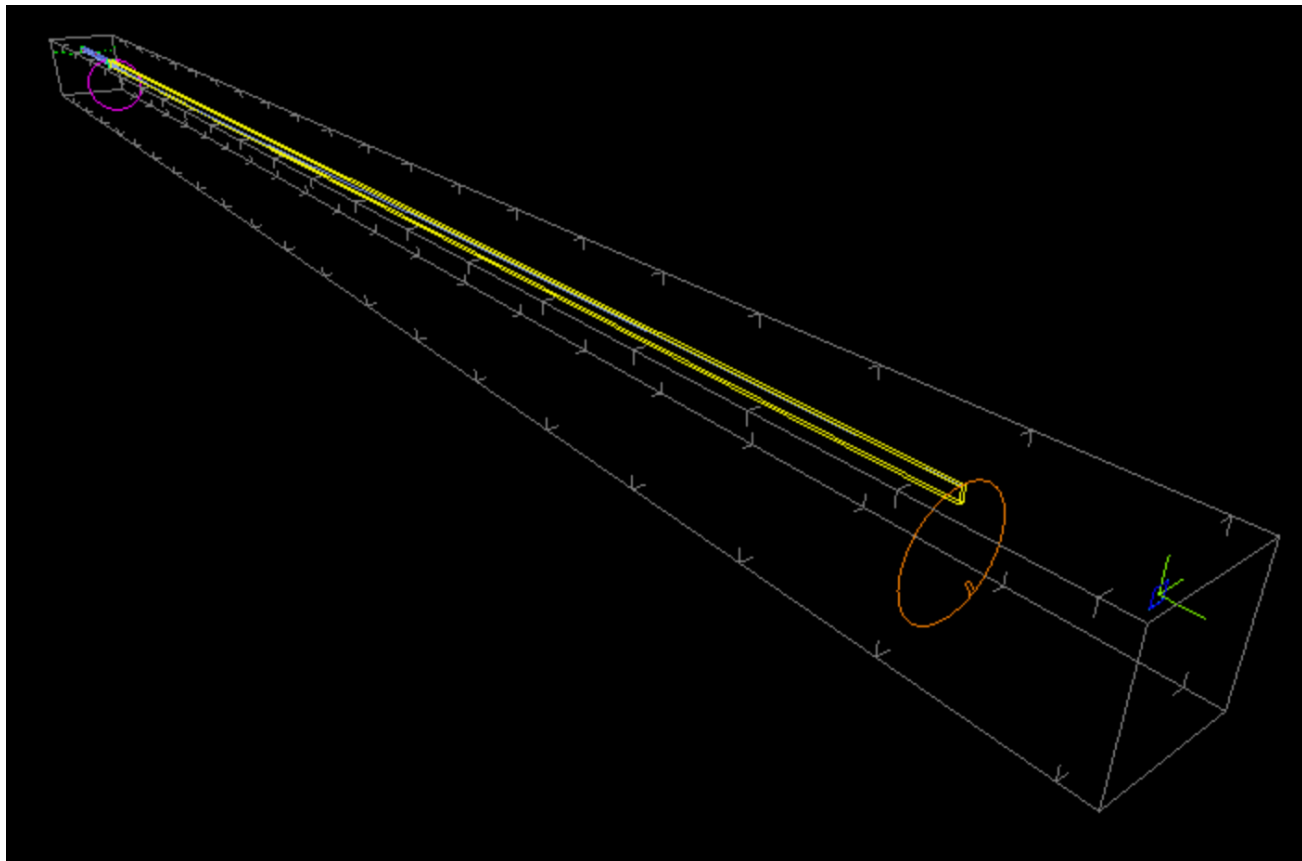


Exercise 3:

1 Build yourself a simple TOF instrument!

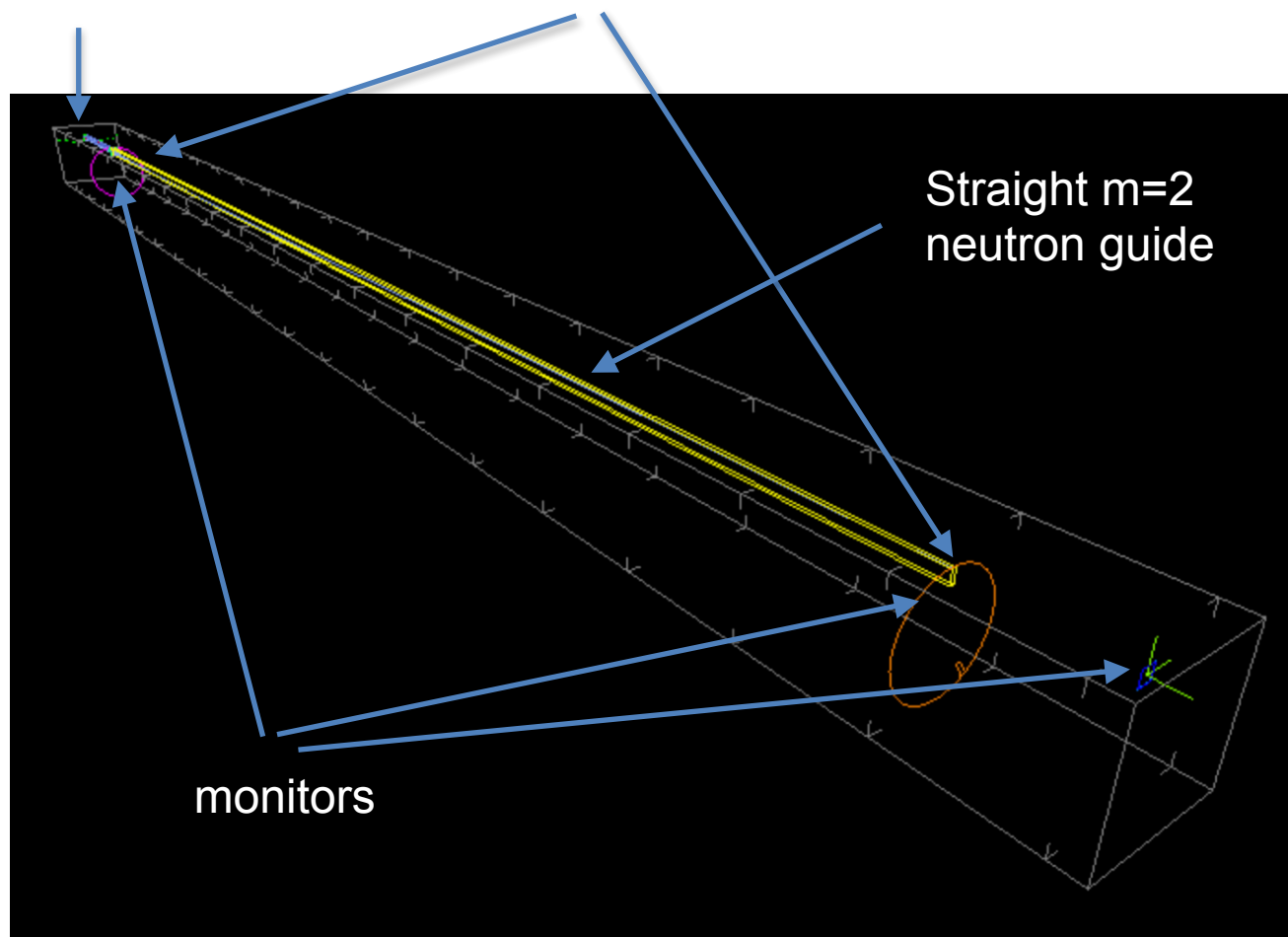


Exercise 3:

Build yourself a simple TOF instrument!

ISIS_moderator

2 Disk_chopper's



Start by inserting a source

```
COMPONENT isis_moderator = ISIS_moderator(  
  Emin=0,  
  Emax=0,  
  dist=2.0,  
  Lmin=0.1,  
  Lmax=10,  
  target_index=0,  
  focus_xw=0.03,  
  focus_yh=0.1)
```

AT (0, 0, 0) RELATIVE PREVIOUS

- ✦ Define wavelength band 0.1-10 Å
- ✦ Focus at rectangle 3 x 10 cm @ 2m



Next, insert a set of monitors at the 2m beamport position

```
COMPONENT PSDsource = PSD_monitor(  
  filename="PSDsource")  
AT (0, 0, 2) RELATIVE isis_moderator
```

```
COMPONENT TOFLsource = TOFLambda_monitor(  
  nL=128,  
  tmin=0,  
  tmax=5000,  
  filename="TOFLsource",  
  Lmin=0.1,  
  Lmax=10)  
AT (0, 0, 0) RELATIVE PREVIOUS
```



... and a first chopper

```
COMPONENT Disk1 = DiskChopper(radius=0.4, yheight=0.12,  
                               nu=nu, nslit=1, theta_0=5,  
                               delay=ttarget1)  
WHEN (choppers) AT (0,0,0.0001) RELATIVE PREVIOUS
```

- ✦ Notice the use of the flag
 - ✦ **WHEN(choppers)**
 - ✦ - so define an input parameter "**choppers**" to control if choppers are in or out
- ✦ Also define the input parameter **nu**
- ✦ See next page





... and a first chopper

- ✦ Calculate the needed **ttarget1** chopper phase for selecting 2 Å neutrons using either
 - ✦ Pocket calculator
 - ✦ the DEFINE & INITIALIZE sections
 - ✦ (hint: the constant AA2MS can be used to convert from k [\AA^{-1}] to v [m/s])
- ✦ Insert another set of monitors after the DiskChopper, remember new filenames for the output



Now a guide...

- ✦ Insert a 17 m straight $m=2$ guide

```
COMPONENT guide = Guide(  
  w1=0.03,  
  h1=0.10,  
  w2=0.03,  
  h2=0.10,  
  l=17)
```

```
WHEN(guide) AT (0, 0, 0.0001) RELATIVE PREVIOUS
```

- ✦ Define an input parameter to control if the guide is in or out

Another chopper...



- ✦ Define a **ttarget2** chopper phase for correctly selecting 2Å neutrons
- ✦ Put a second DiskChopper and sandwich it in sets of monitors like before.

- ✦ Visualise the instrument using
 - ✦ `mcdisplay-pyqtgraph`
 - ✦ `mcdisplay-webgl`
 - ✦ `mcdisplay-pyqtgraph --tof`
 - ✦ - and ensure all looks OK



Run simulations to

- ♦ See that you are in fact selecting 2\AA neutrons
- ♦ Compare intensities with and without guide, with and without choppers
- ♦ Optionally insert a PowderN sample and a cylindrical TOF monitor - find the relevant parameters using the documentation tools.