

Low Energy Recoil: needs

- Maximo's cross section weighted neutron generator
- Maximo's “debug” output to track particle history
- S1/S2 quenching code
- Maximo's segmented neutron detector

Done

- generator: DSGeneratorReDMaximo
 - ~~G4GeneralParticleSource~~ → AddPrimaryVertex
 - cross section by Legendre polynomials: root → gsl (geant4?)

~~/gps/pos/xxx ...~~

```
/ds/generator/select ReDMaximo
/ds/generator/red/NeutronBeam/ThetaX 18.36 deg
/ds/generator/red/NeutronBeam/PhiX -12.75 deg
/ds/generator/red/SiliconTagger/Theta 5.15 deg
```

- particle history: DSSteppingAction, DSTrackingAction
 - number of interactions in the TPC
 - recoil information (energy, position, direction)
 - process id (elastic, inelastic)

```
/ds/manager/writedaughters 1
```

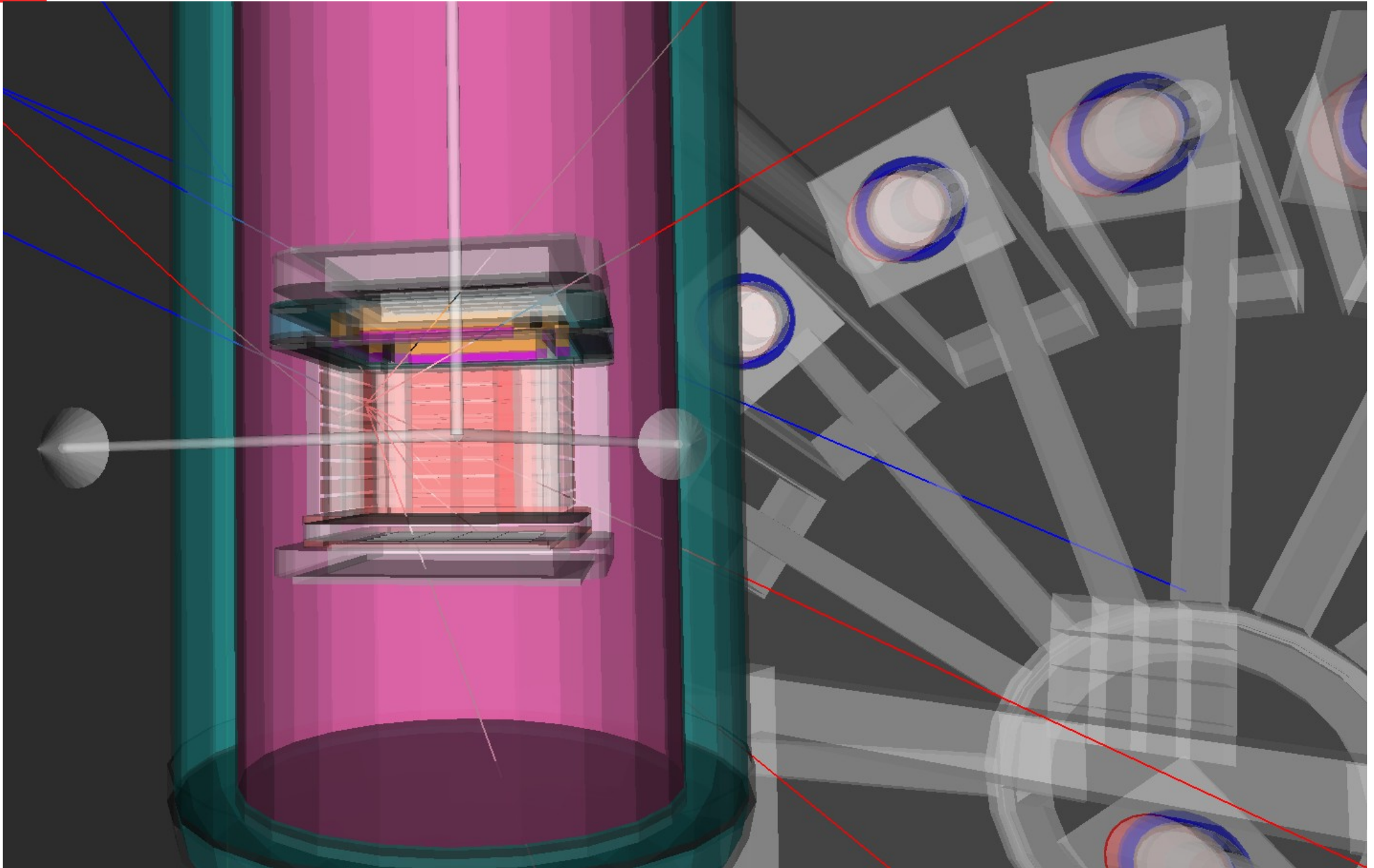
- neutron detector (16 EJ309 cuboids 3 cm x 3 cm, length 5 cm):
 - beam_survey.txt

```
80.0 cm 5.0 deg 180.0 deg lre
```

- quenching: tools/g4rooterReD.C

Have a look in g4ds10/Linux-g++ at red_lnsMaximo.mac and beam_survey.txt

Neutron Detector Matrix



Run @ CNAF

- root with libMathMore:

- /storage/gpfs_ds50/darkside/users/kussds/glast/ground/GLAST_EXT/redhat6-x86_64-64bit-gcc44/ROOT/v5.34.34
- g++ ... -o ./Linux-g++/g4ds ... -lMathMore

- gsl and lzma (rhel6_64):

```
$ ls -l /storage/gpfs_ds50/darkside/users/kussds/system/usr/lib64/
total 2400
lrwxrwxrwx 1 kussds darkside      20 Jan 18 16:22 libgslcblas.so.0 -> libgslcblas.so.0.0.0
-rwxr-xr-x 1 kussds darkside 228176 Nov 23 2010 libgslcblas.so.0.0.0
lrwxrwxrwx 1 kussds darkside      16 Jan 18 16:22 libgsl.so.0 -> libgsl.so.0.14.0
-rwxr-xr-x 1 kussds darkside 2061080 Nov 23 2010 libgsl.so.0.14.0
lrwxrwxrwx 1 kussds darkside      16 Aug 25 2015 liblzma.so.0 -> liblzma.so.0.0.0
-rwxr-xr-x 1 kussds darkside 137264 Jun 19 2014 liblzma.so.0.0.0
```

- running: 10 x 200k neutrons

- /storage/gpfs_ds50/darkside/users/kussds/190204_LER/ReD_LNS_Neutron.root