

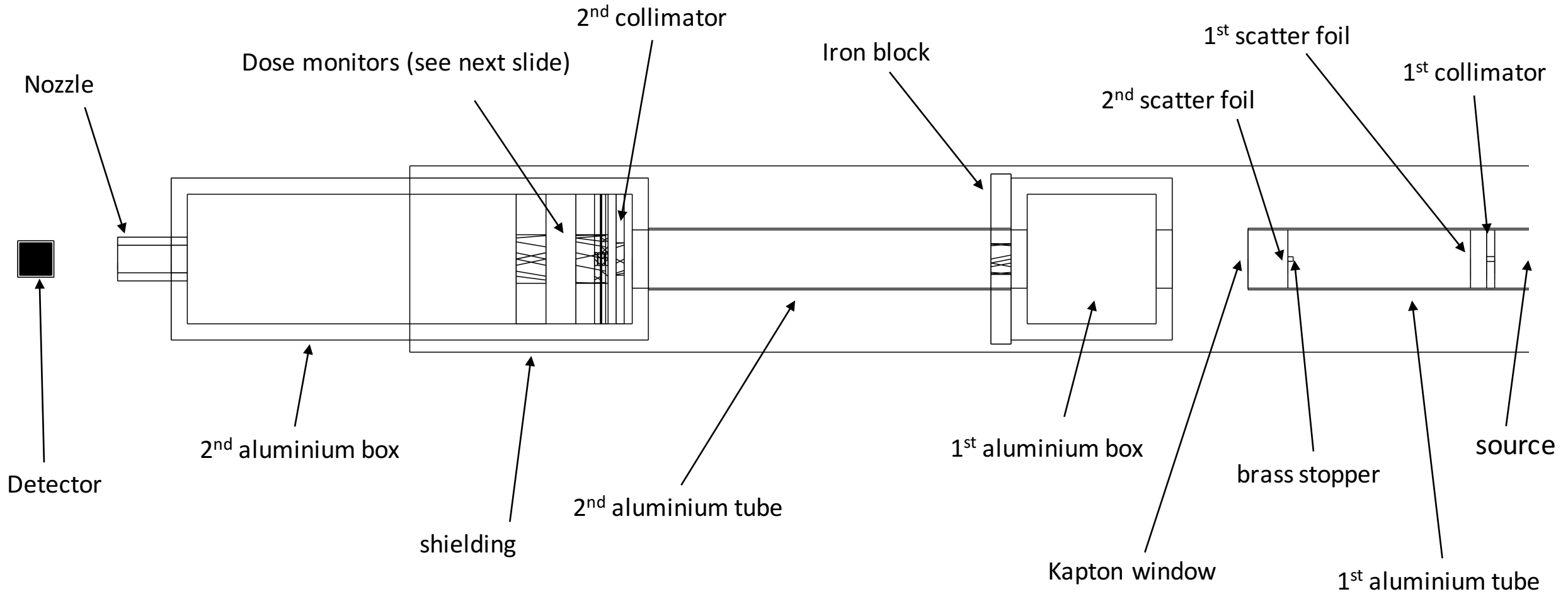
Updated the beamline construction:

- Hole in iron block was too small
- Second hole in second aluminium box was also too small
- Still don't know where second dose monitor should be

Ran simulations again to check flux after scattering components:

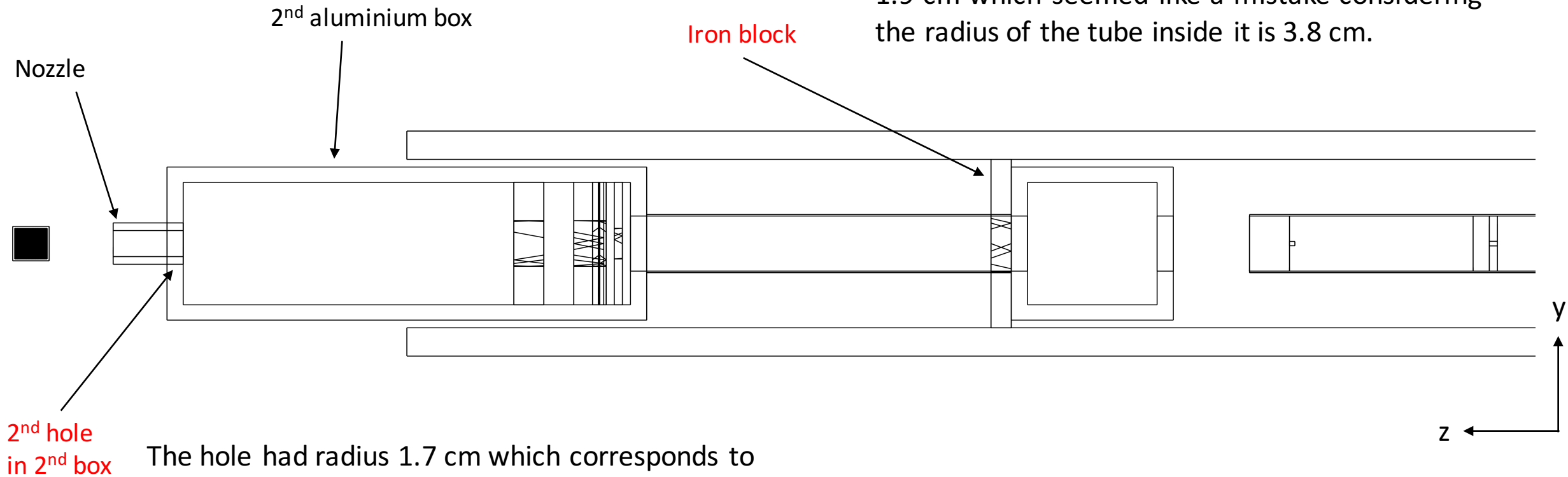
- Simulations not yet running using qsub: output currently being overwritten by the most recent simulation. Need to save output separately and then merge.
- For some reason simulations now take 24 hours so haven't yet got energy distributions and spatial distributions in xy
- Longitudinal flux mesh values larger than expected. Expected an initial value of 10,000 but result is slightly larger than that.
- Same initial value problem in lateral flux meshes.

Original beamline - DetectorConstruction.cc



Corrections to DetectorConstruction.cc

Now using top-down view.



Previously, the hole in the iron block had radius 1.9 cm which seemed like a mistake considering the radius of the tube inside it is 3.8 cm.

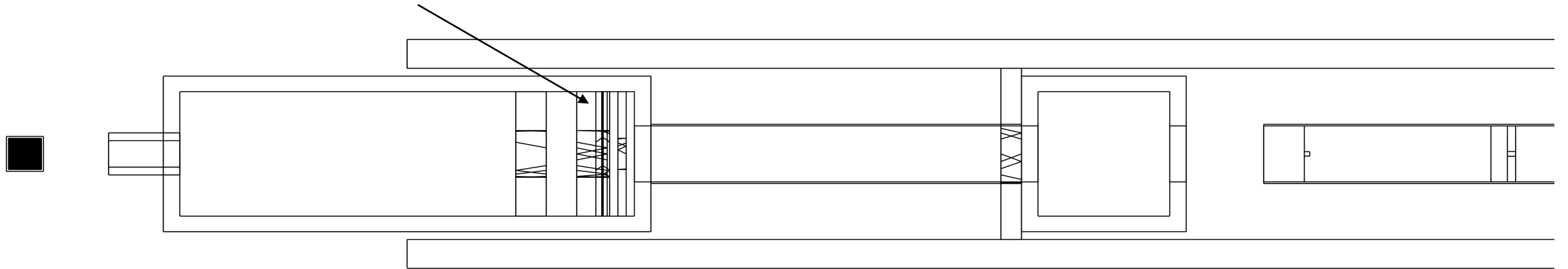
2nd hole
in 2nd box

The hole had radius 1.7 cm which corresponds to the inner radius of the nozzle. To avoid overlap, match the radius of the hole to the outer radius of the nozzle at 2.7 cm.

Dose monitors in DetectorConstruction.cc

Couldn't find more information on the different dose monitors in R. Stephen's logbook so removed one of the dose monitors for now.

The dose monitors overlap completely in second aluminium box.



Protons from G4GeneralParticleSource at 62.500 MeV:

Gaussian, plane, circle, radius = 3 mm, sigma x = sigma y = 0.0 cm

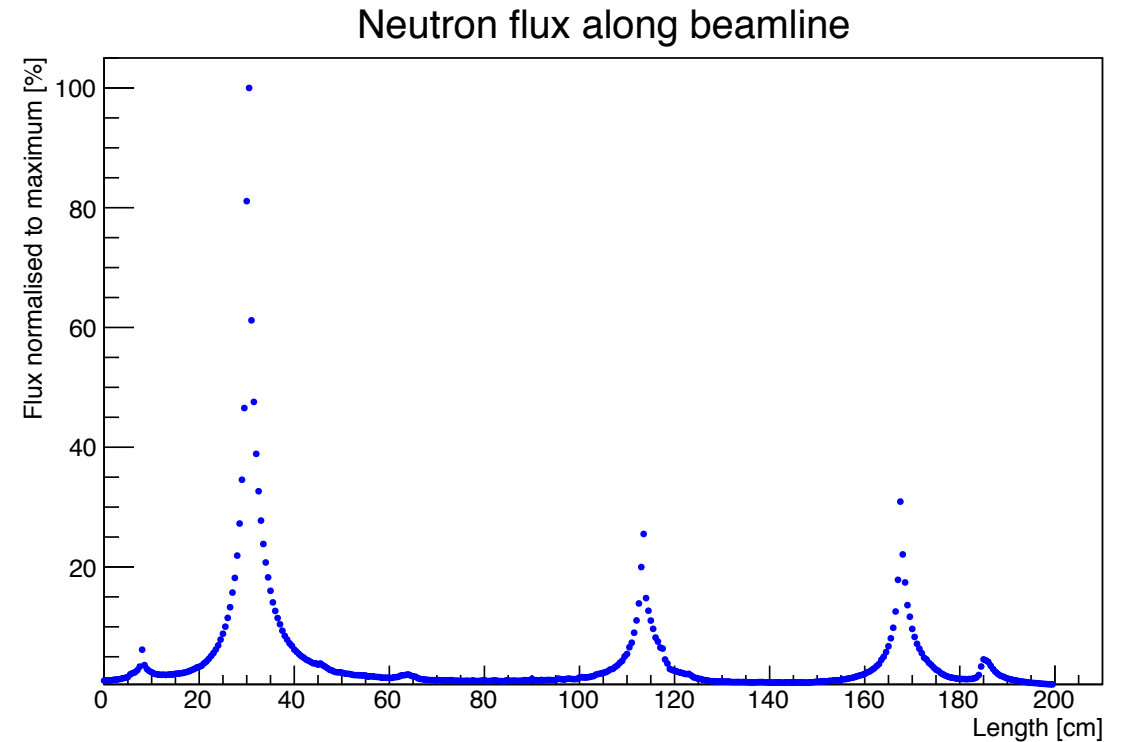
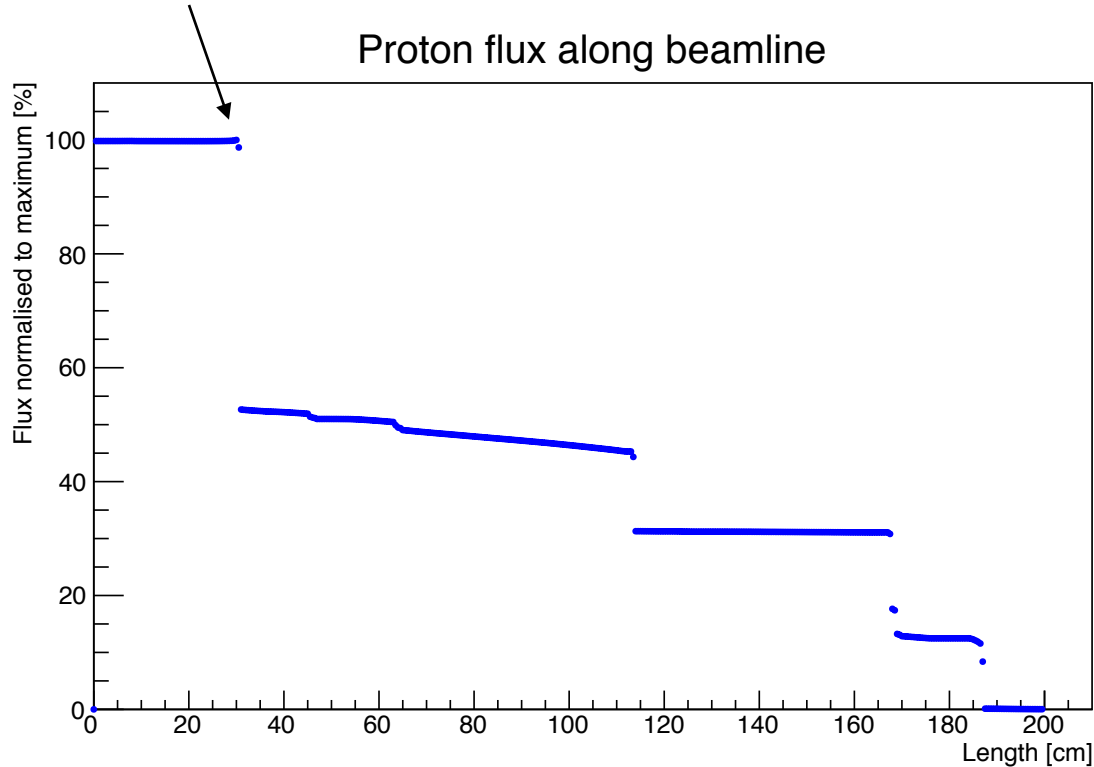
1,000,000 events

Used a longitudinal scoring mesh extending at length 200 cm from source with 400 bins.

Dimensions of mesh: 10 x 10 x 200 cm³

Changed scoring quantity from cellFlux to flatSurfaceFlux.

Not sure why there is an increase in the proton flux here.



Distance from source

Flux scorers

The initial value in the longitudinal proton flux scorer is 10000.00000021961.

I expected to see a value of 1,000,000 protons / 10 x 10 cm² = 10000.0 percm²

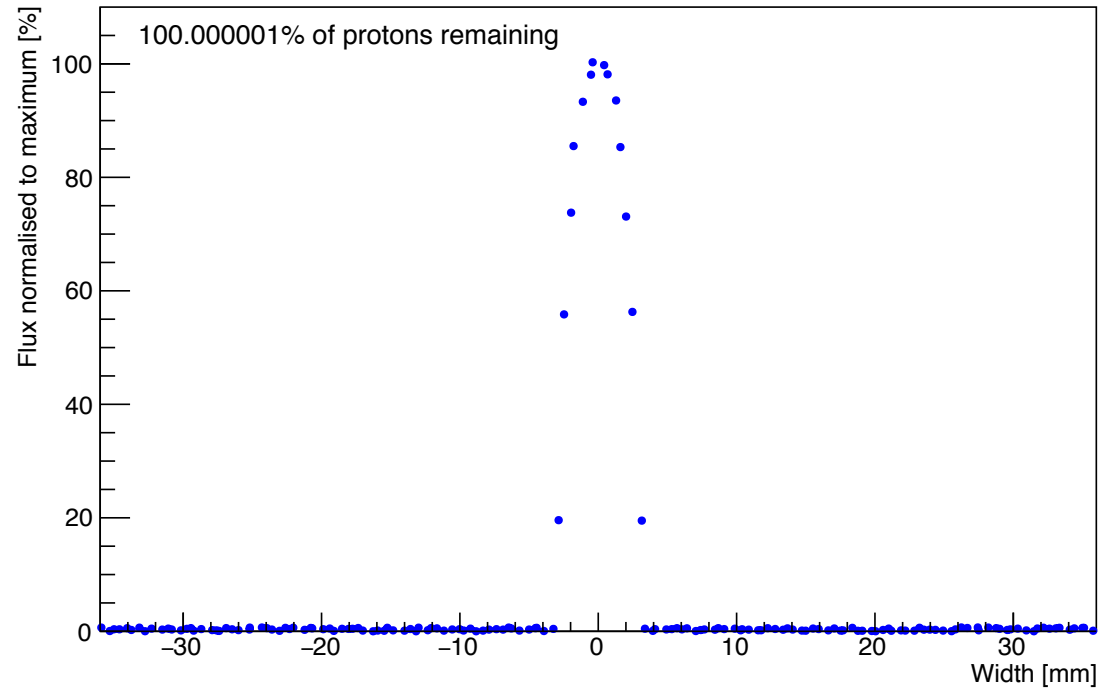
The z values correspond to the position of the scoring mesh. Each mesh spans the width of the corresponding component and has depth 0.1 cm.

Each plot spans the width of the component. Used 1,000,000 for the initial value in the calculation of the percentage of protons remaining, hence the higher than expected value for the first two plots.

Flux scorers

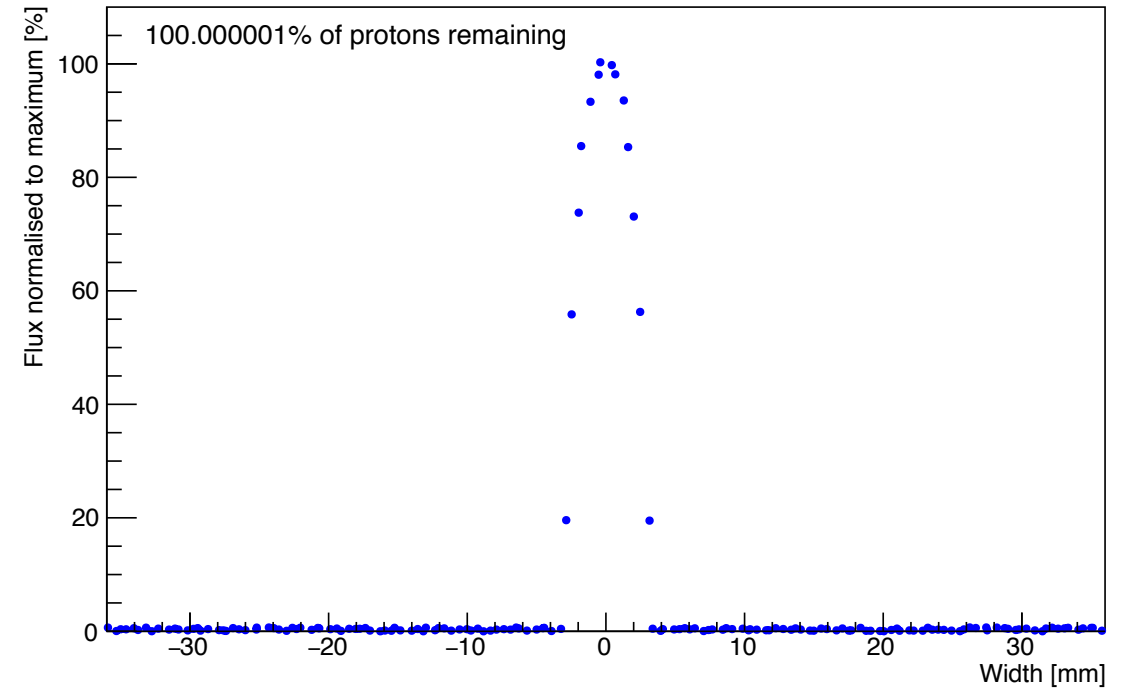
Source, $z = 1$ cm

Lateral flux deposition



Collimator 1, $z = 7$ cm

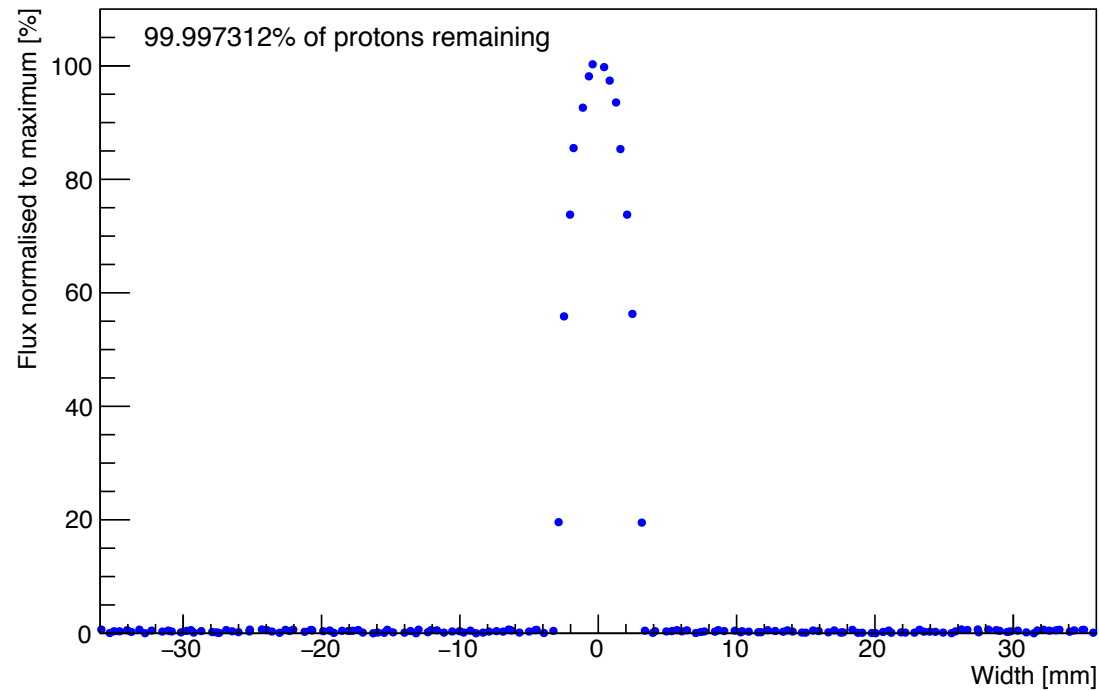
Lateral flux deposition



Flux scorers

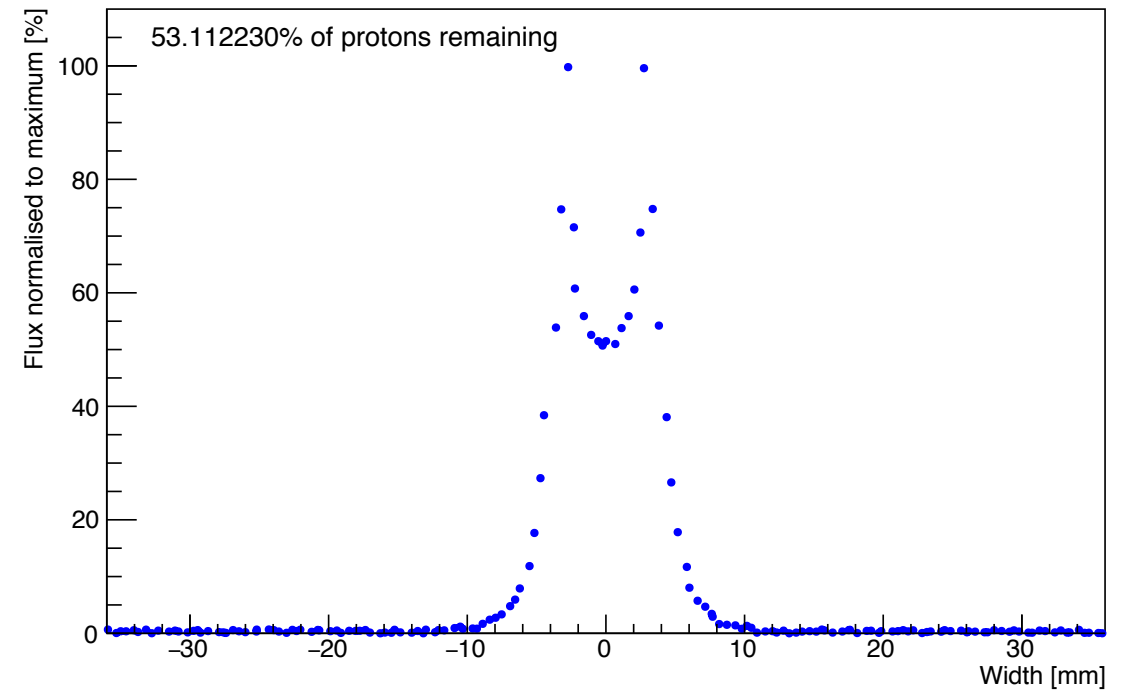
Foil 1, $z = 8.5$ cm

Lateral flux deposition



Stopper, $z = 30.71$ cm

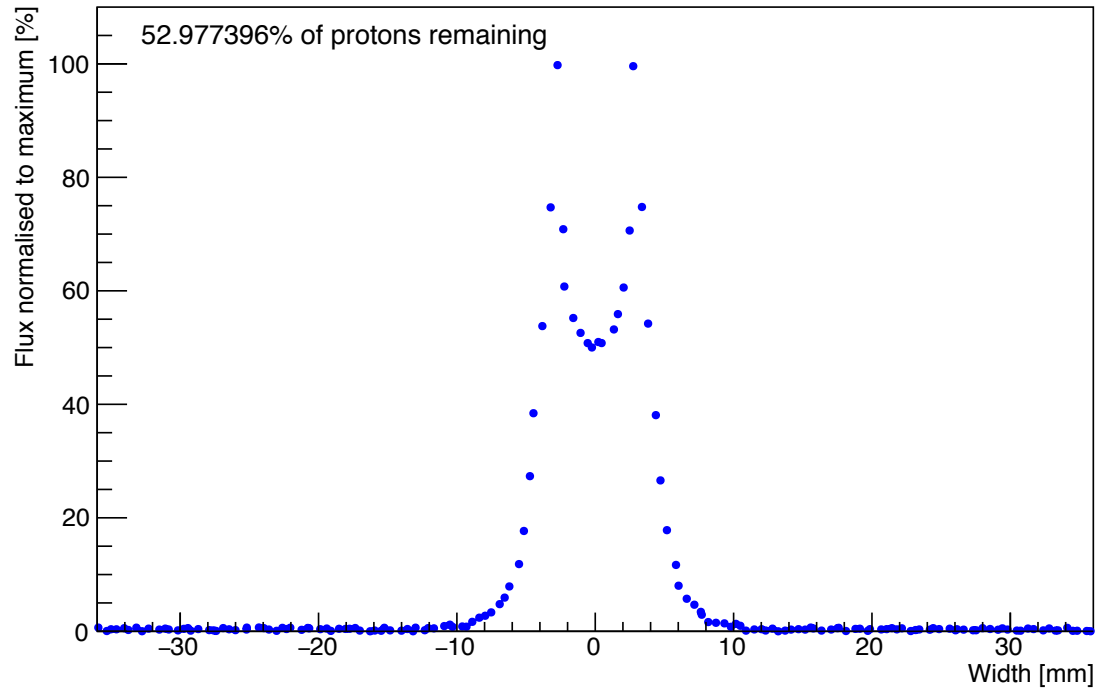
Lateral flux deposition



Flux scorers

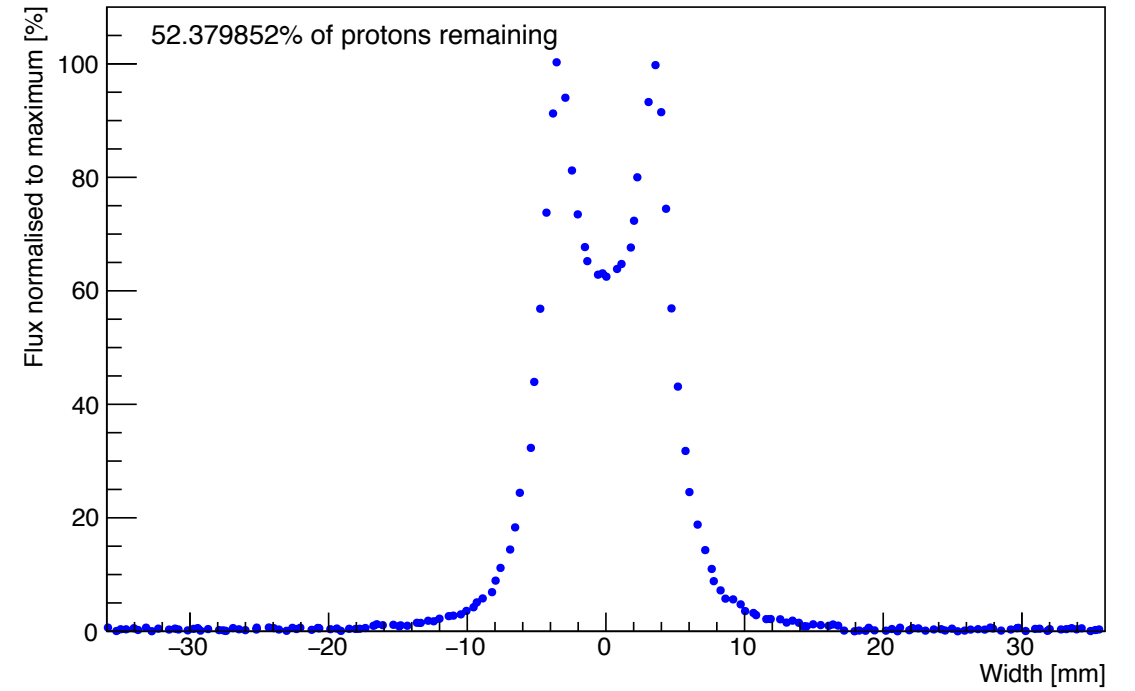
Foil 2, $z = 30.7125$ cm

Lateral flux deposition



Kapton window, $z = 35.654$ cm

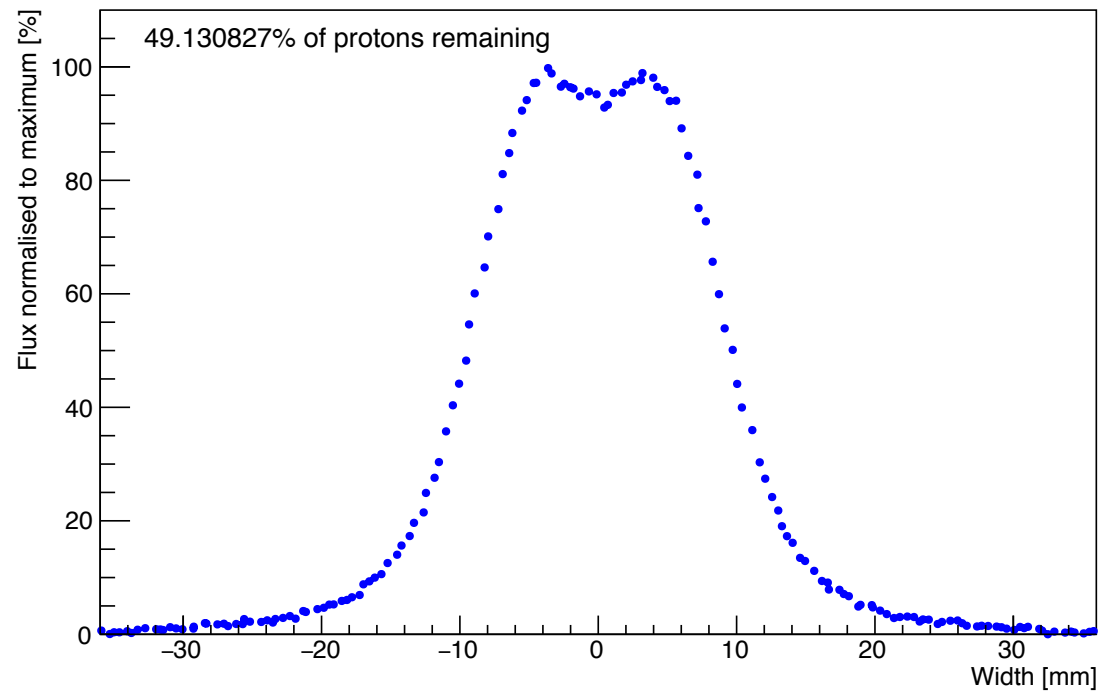
Lateral flux deposition



Flux scorers

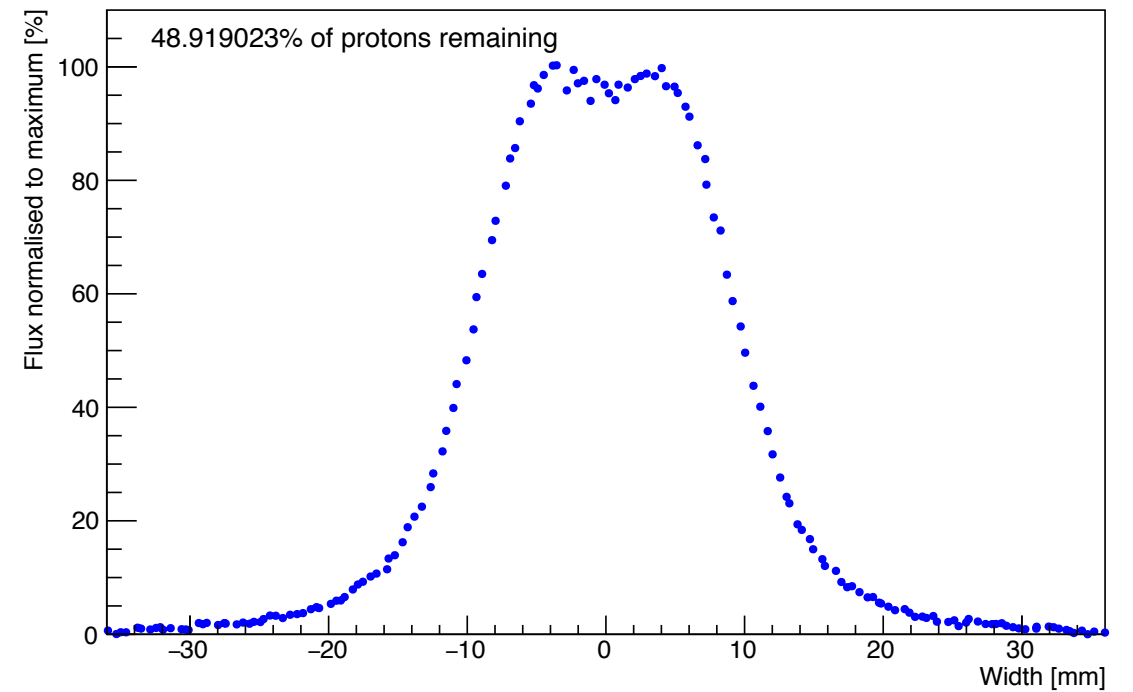
Before iron block, $z = 65.05$ cm

Lateral flux deposition



After iron block, $z = 67.6$ cm

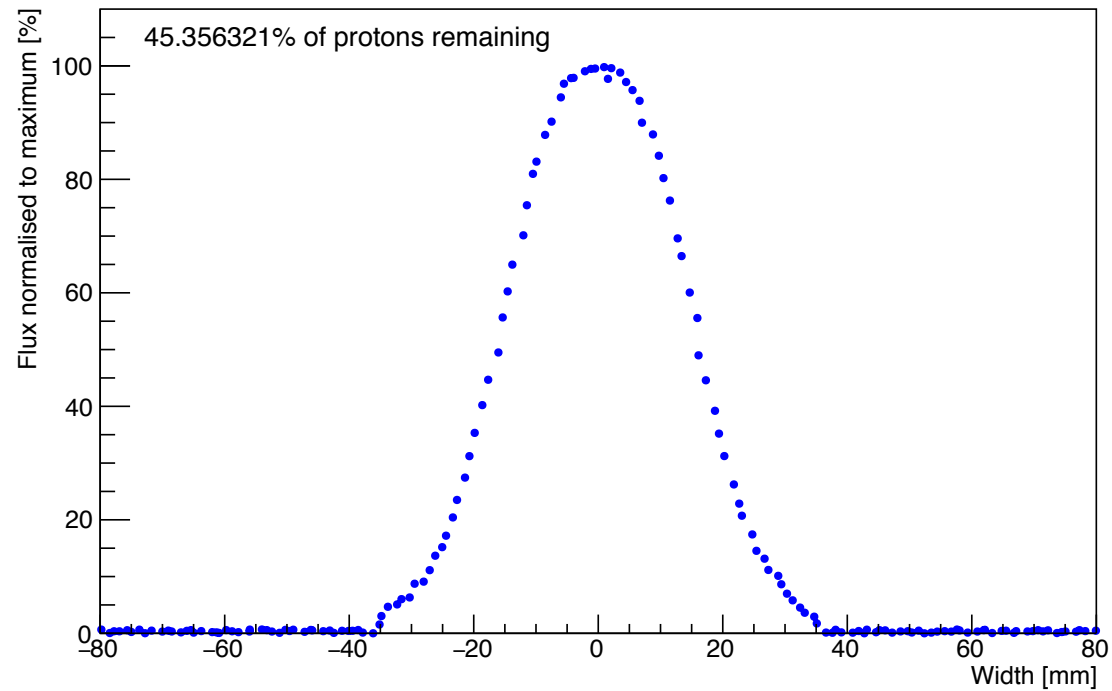
Lateral flux deposition



Flux scorers

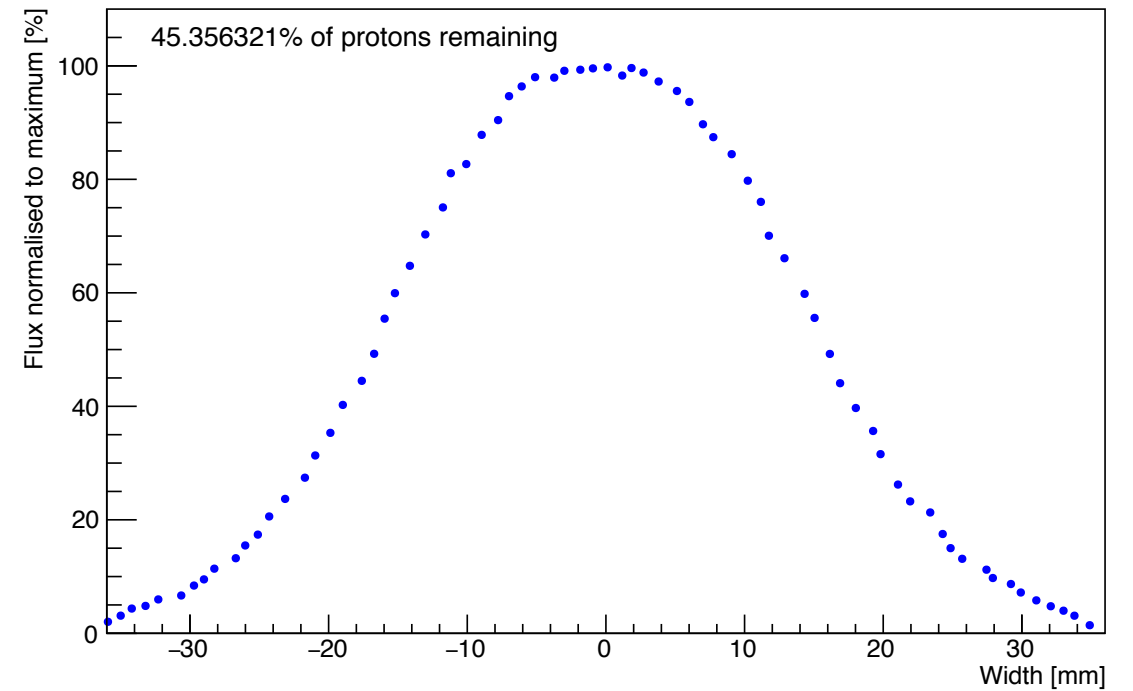
After first hole in second box, $z = 112.1$ cm

Lateral flux deposition



<- Zoomed in

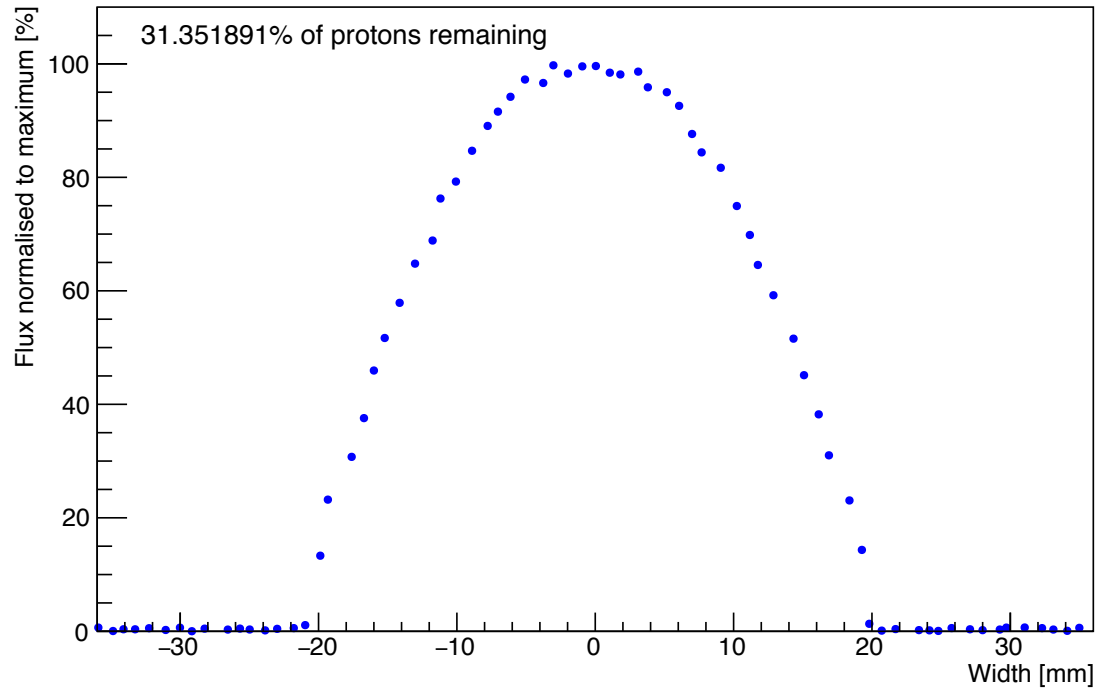
Lateral flux deposition



Flux scorers

Collimator 2, $z = 114.5$ cm

Lateral flux deposition



Nozzle, $z = 175.9$ cm

Lateral flux deposition

