Clatterbridge beamline simulation

Roisin Stephens
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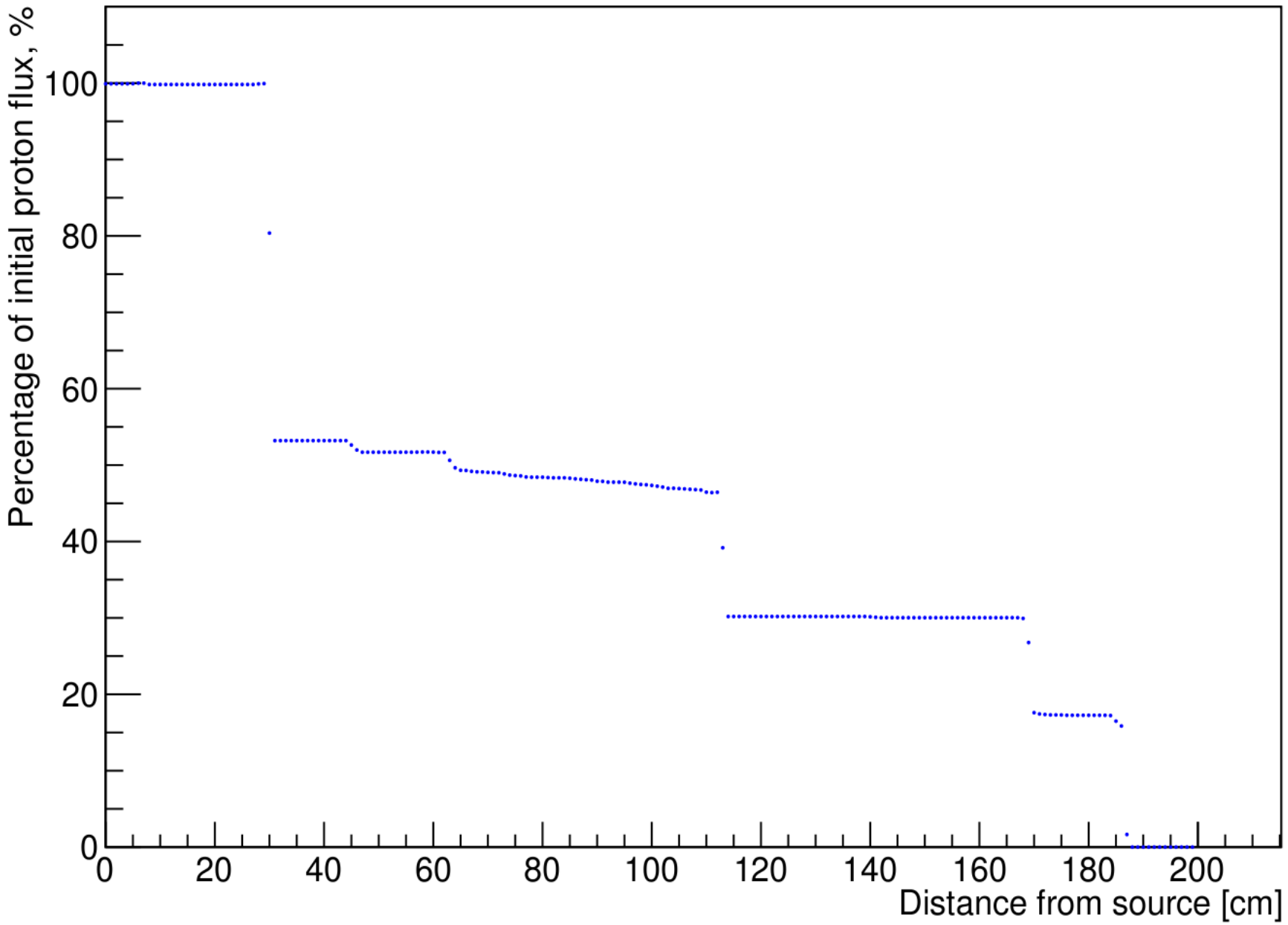
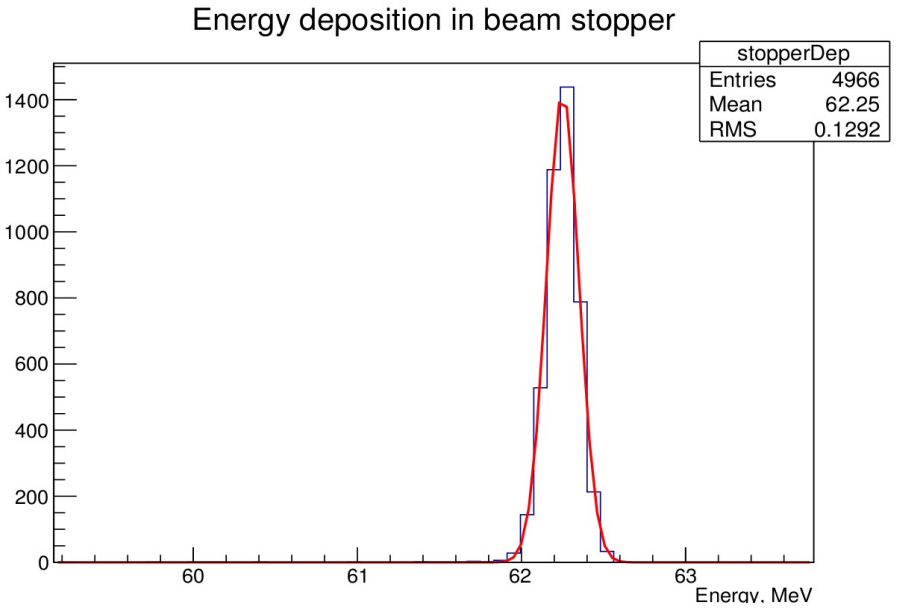
Proton flux along beamline

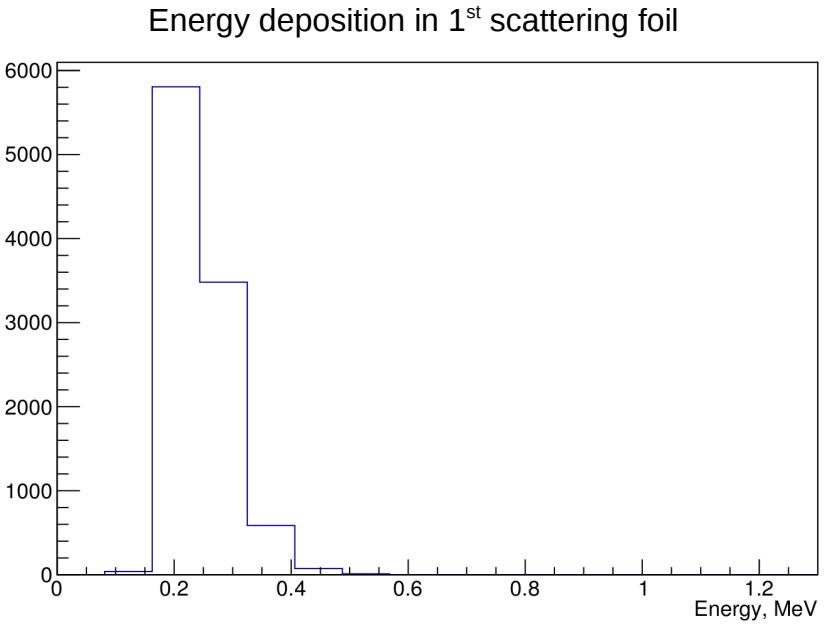


Measuring kinetic energy – Sensitive Detectors

- Set beamline components as sensitive detectors to measure the energy of each proton



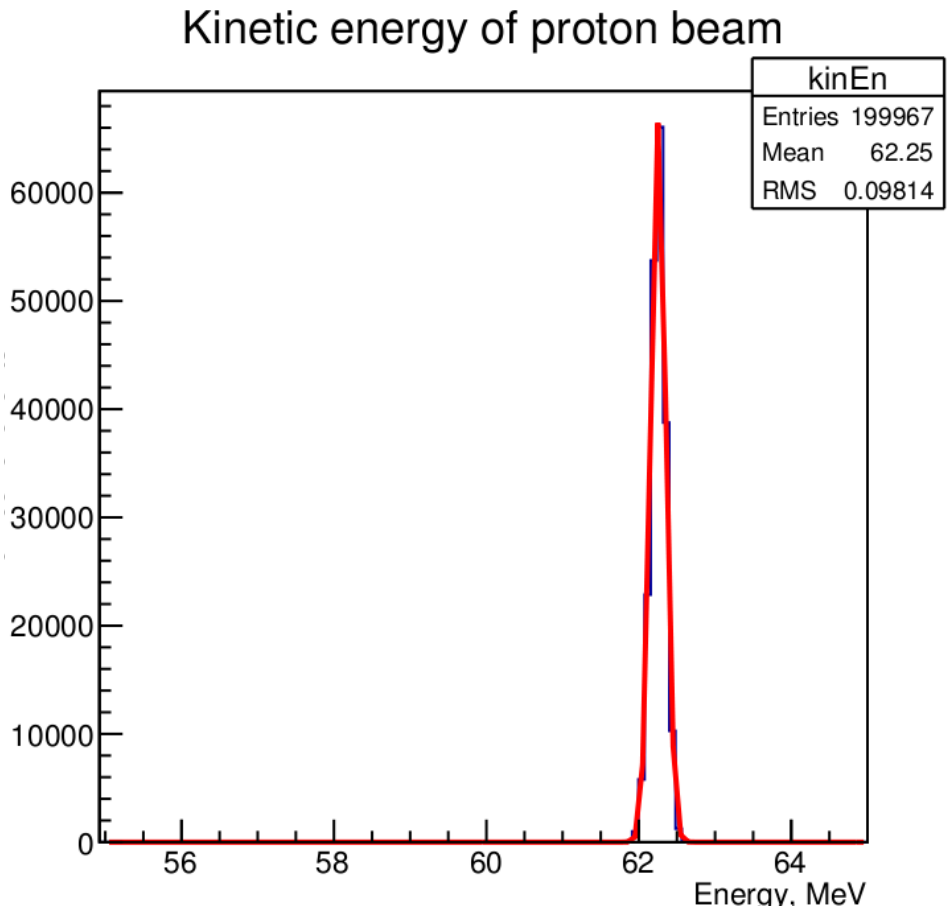
- Only effective for components with which the beam interacts the most, i.e. does not work for components with large apertures or small depths.

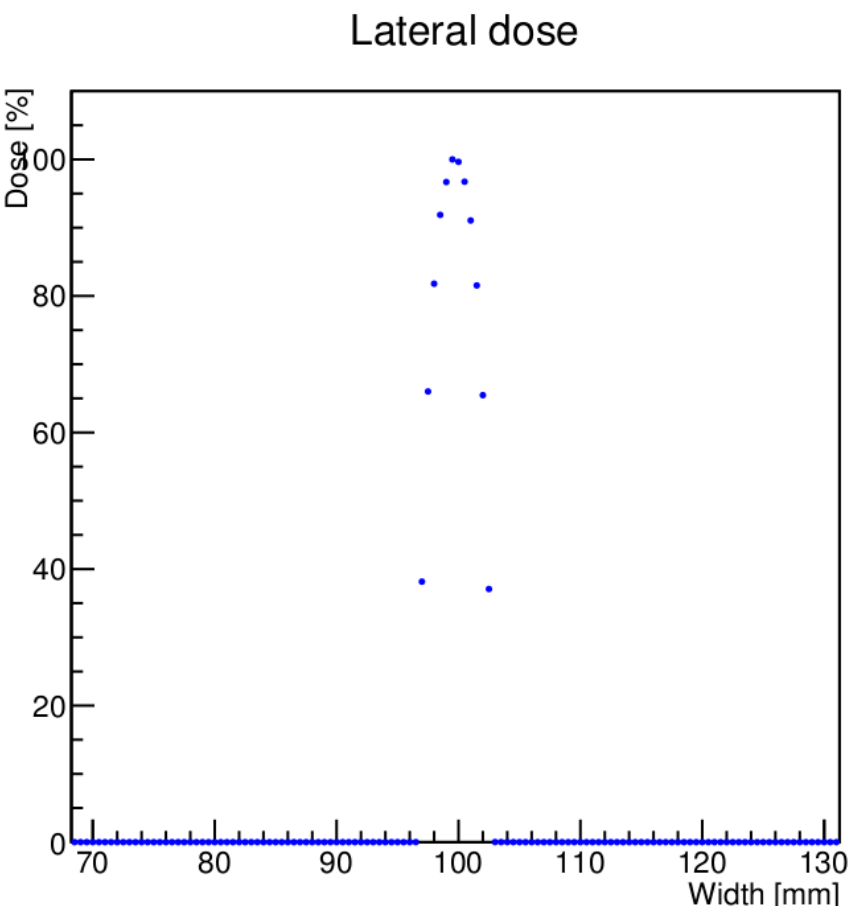


Alternative method – measure kinetic energy step-by-step

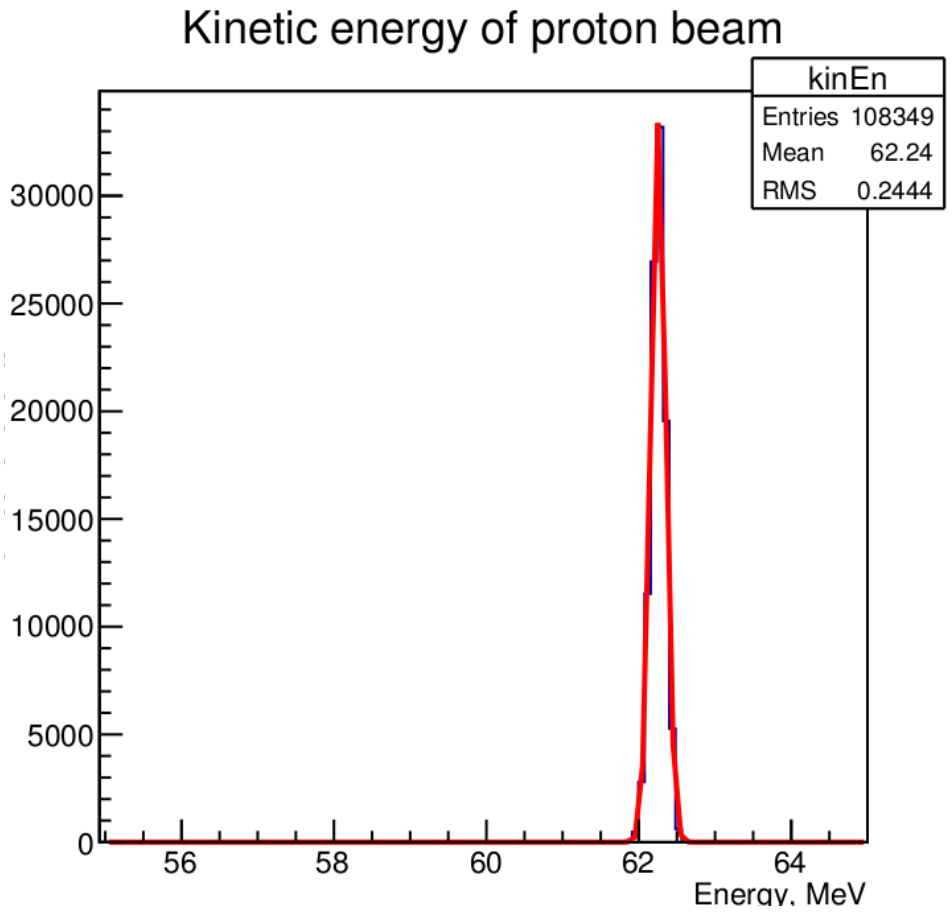
- Input a value for position in z
- At each step the proton's pre-step position is checked – if it is equal to the input value the kinetic energy is recorded
- Method is limited by step length, set by the physics list used
- Kinetic energy and lateral dose readings were taken after each component
- Lateral dose was recorded using a lateral scoring mesh

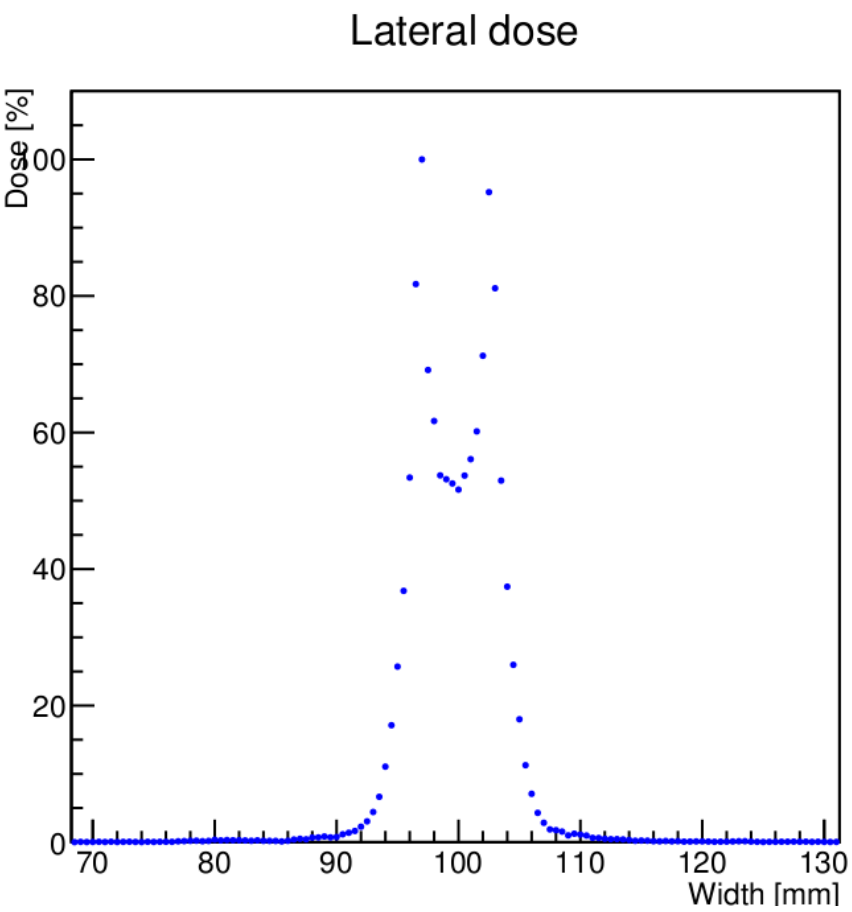
Scattering Foil 1 (80.025 mm from source)



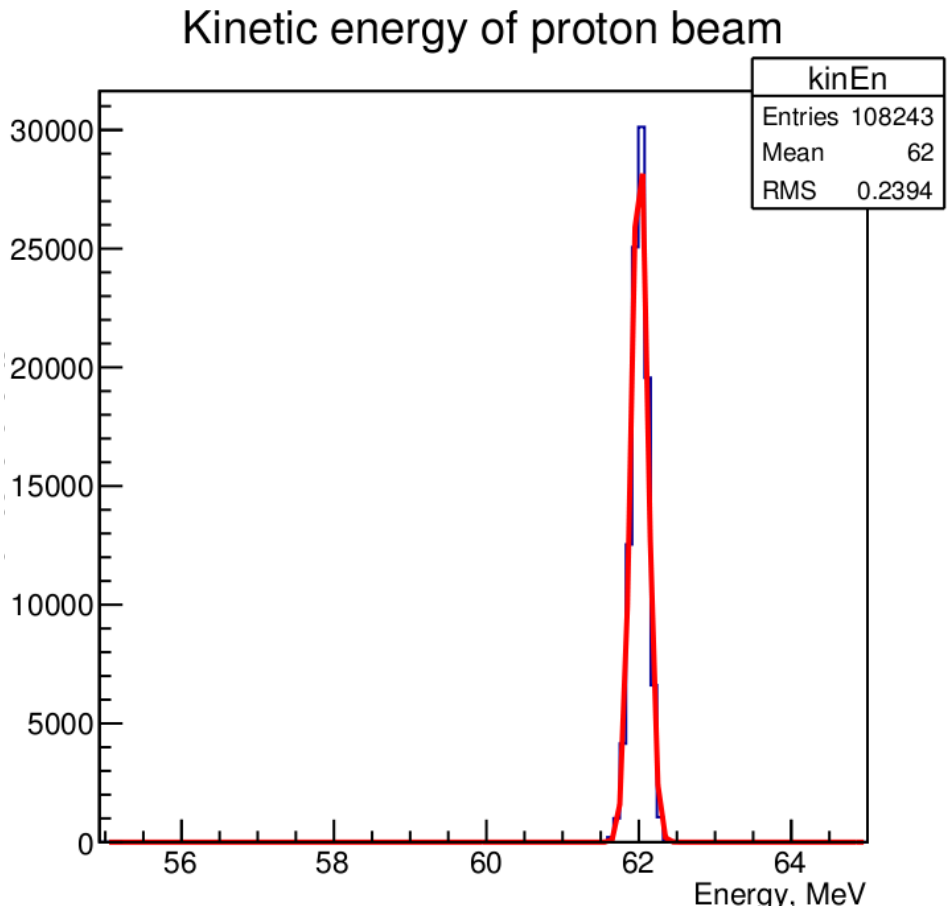


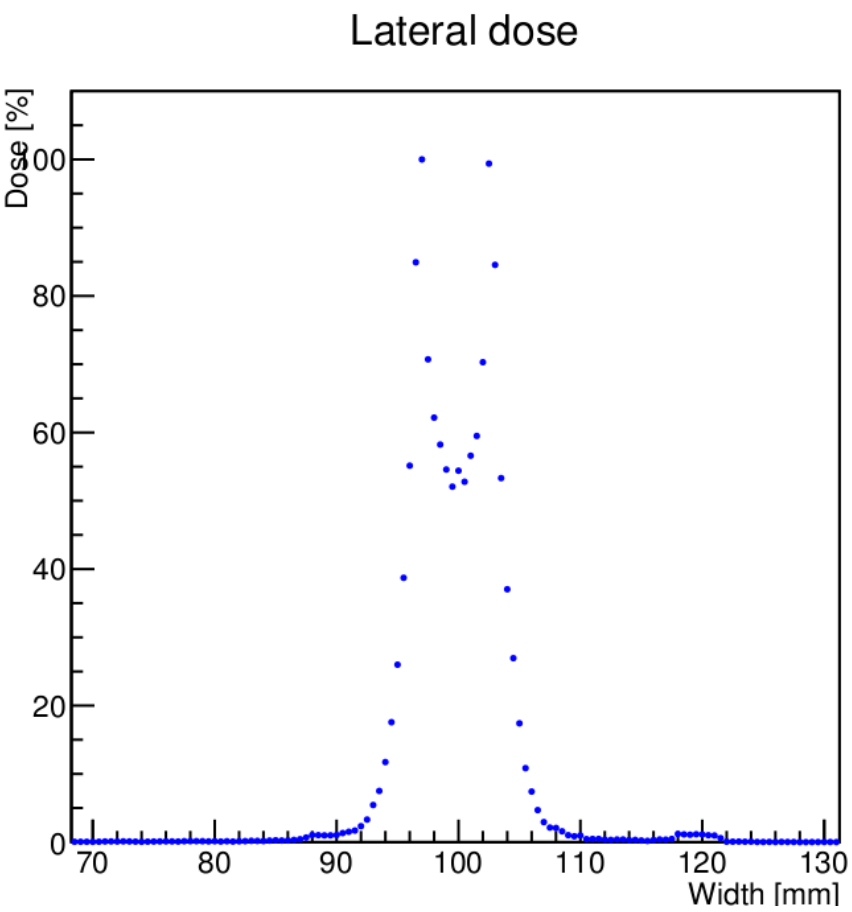
Brass stopper (306.6 mm from source)



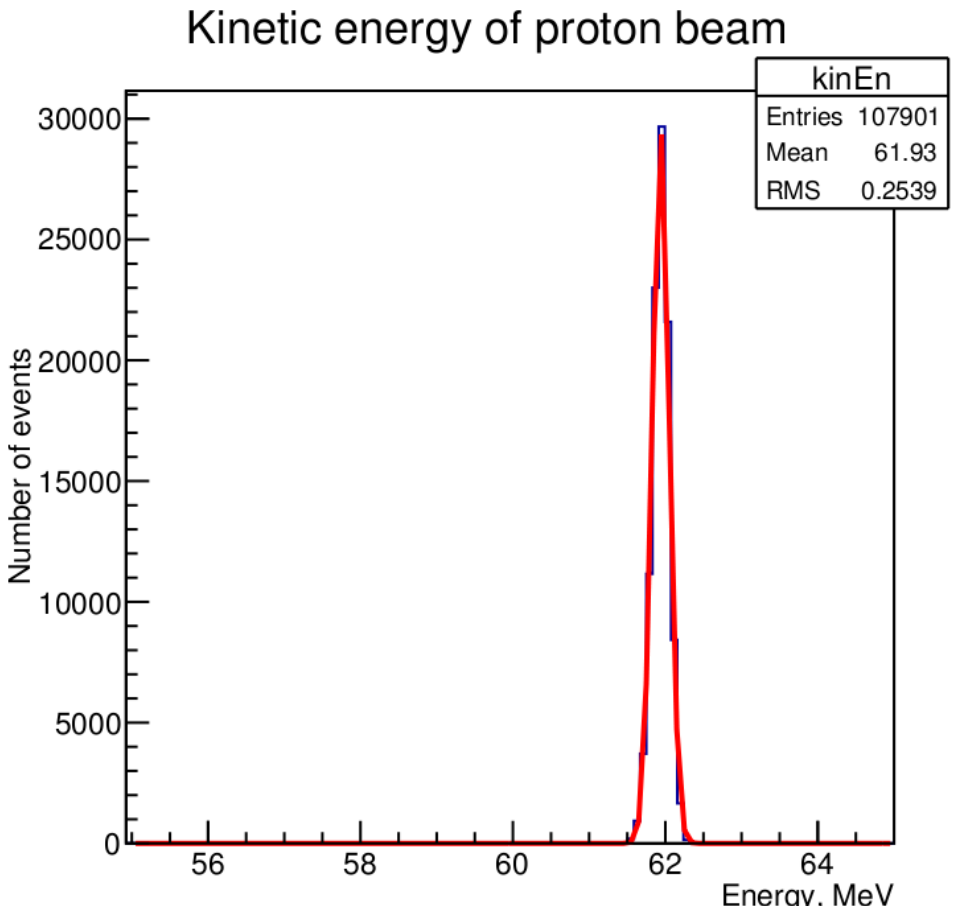


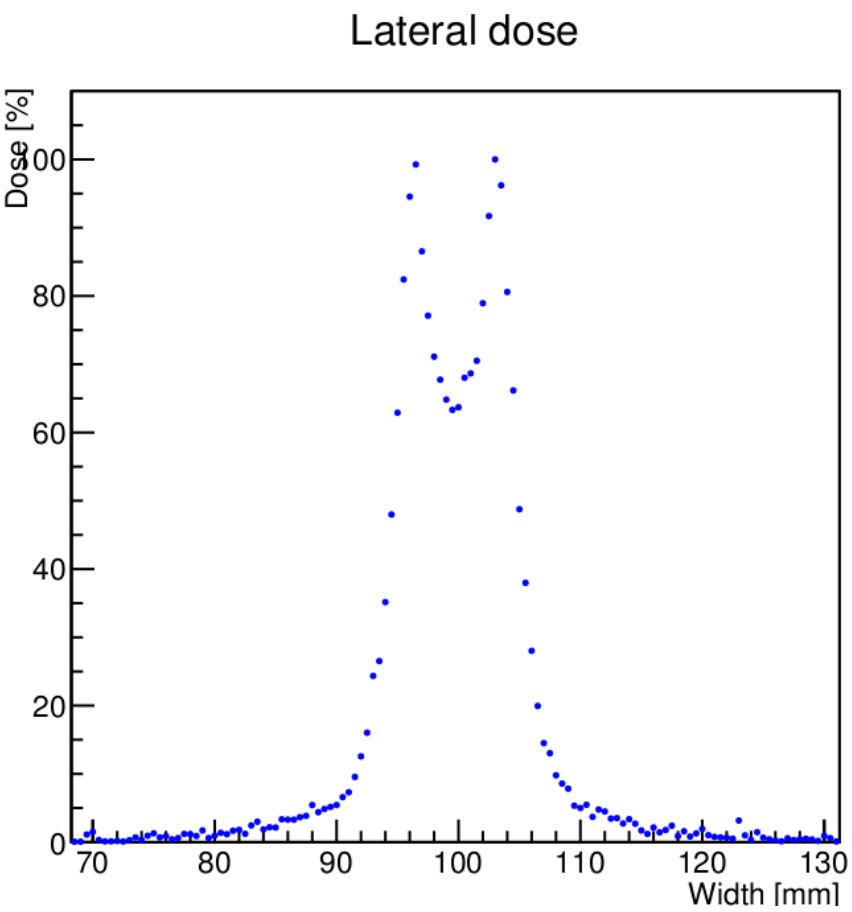
Scattering Foil 2 (306.625 mm from source)



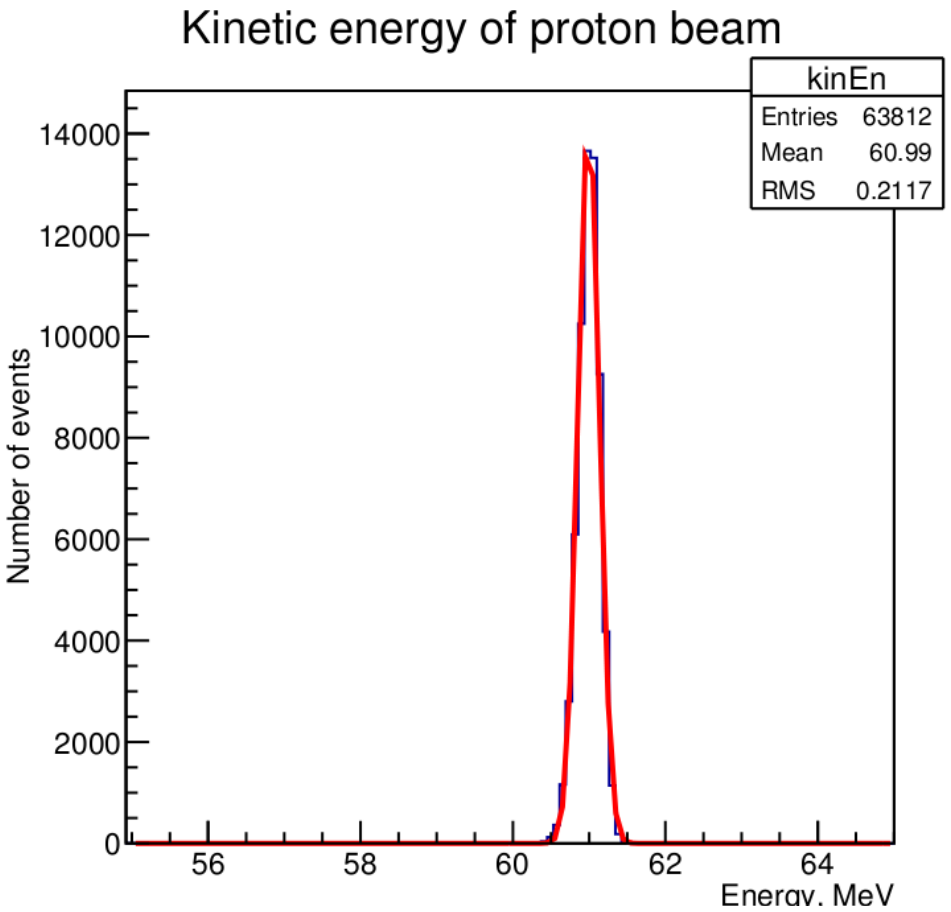


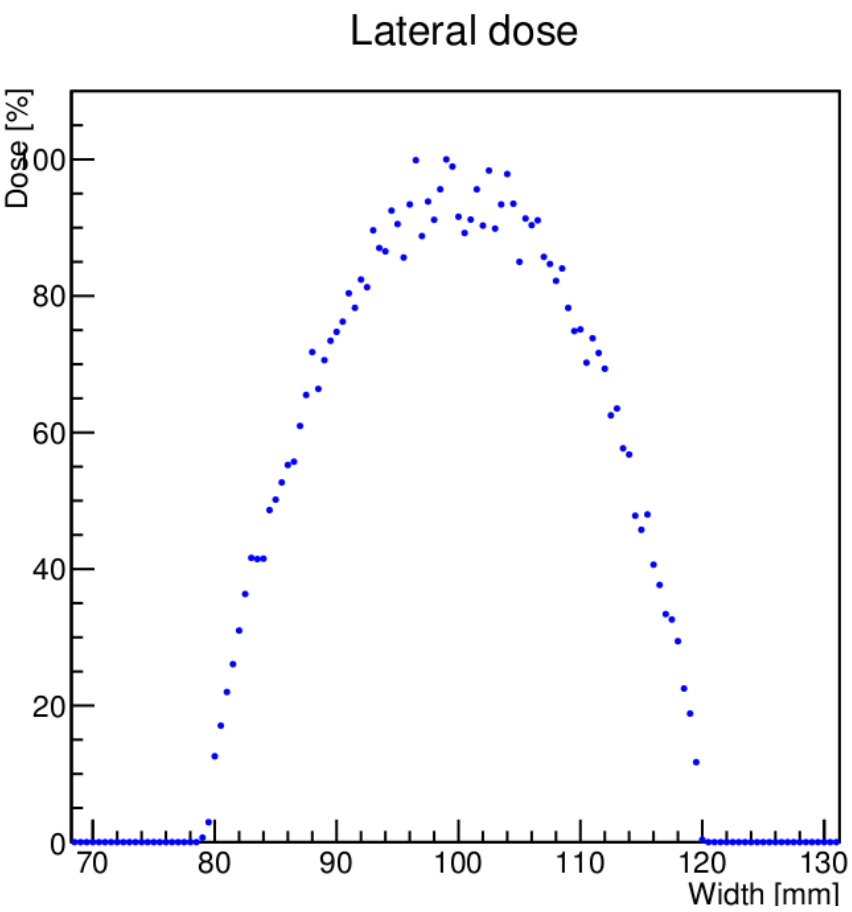
Kapton Window (356.05 mm from source)



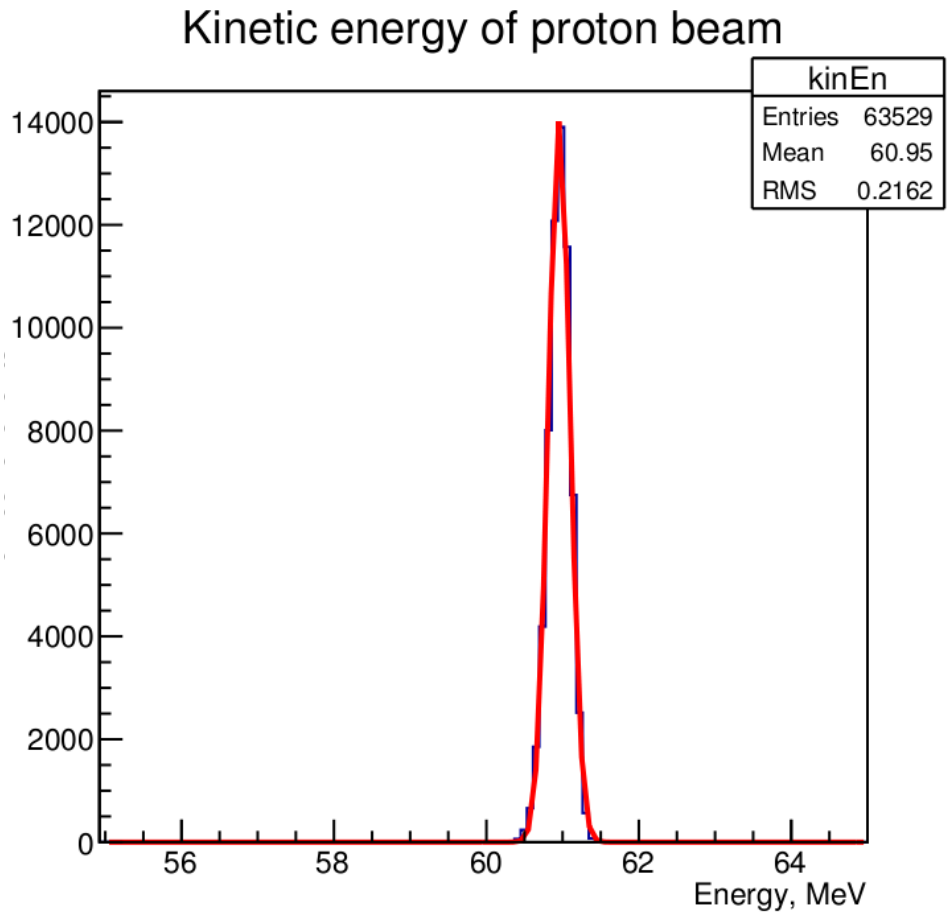


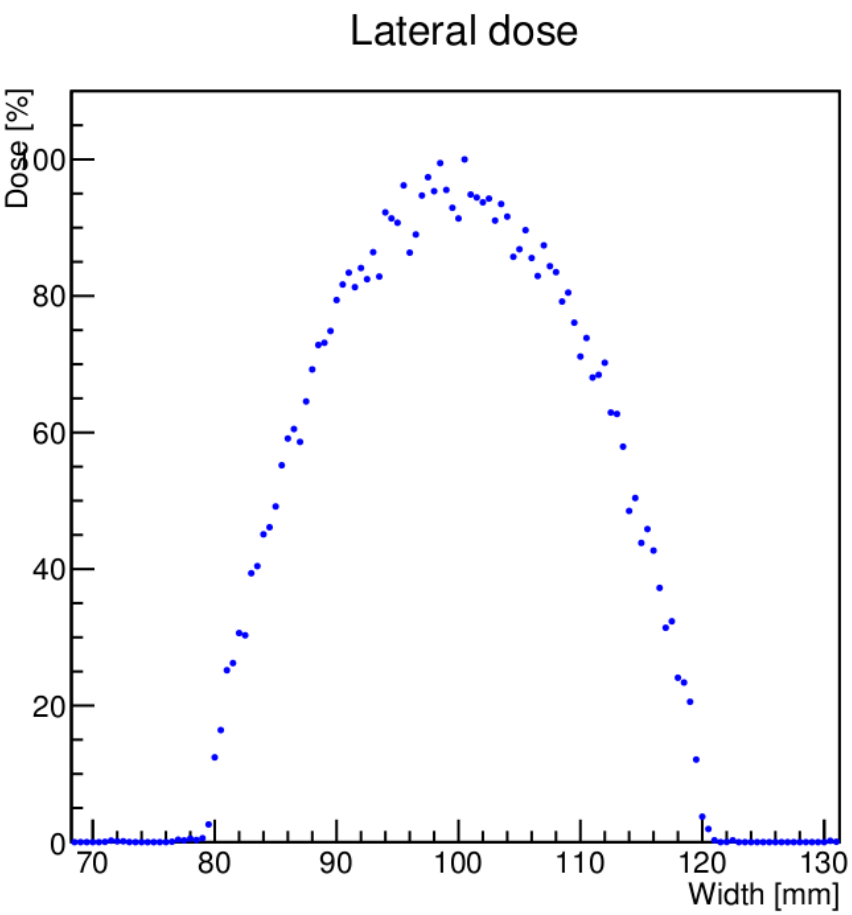
Anti-scatter collimator 1 (1140.5 mm from source)



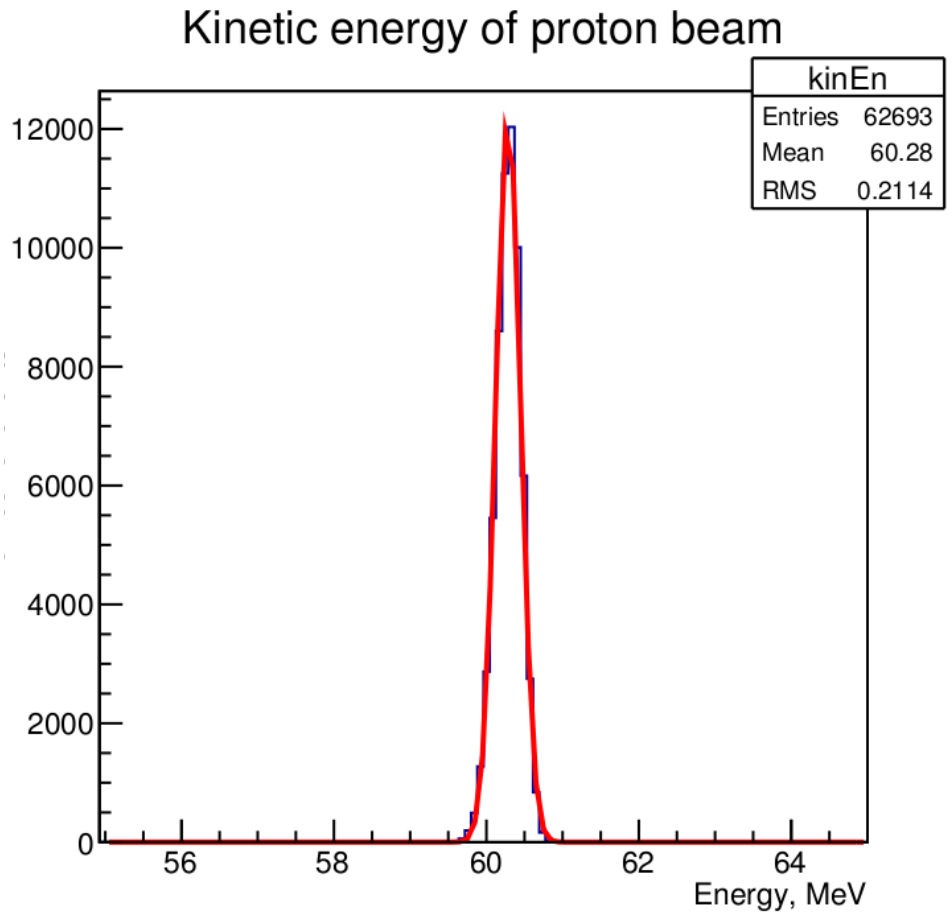


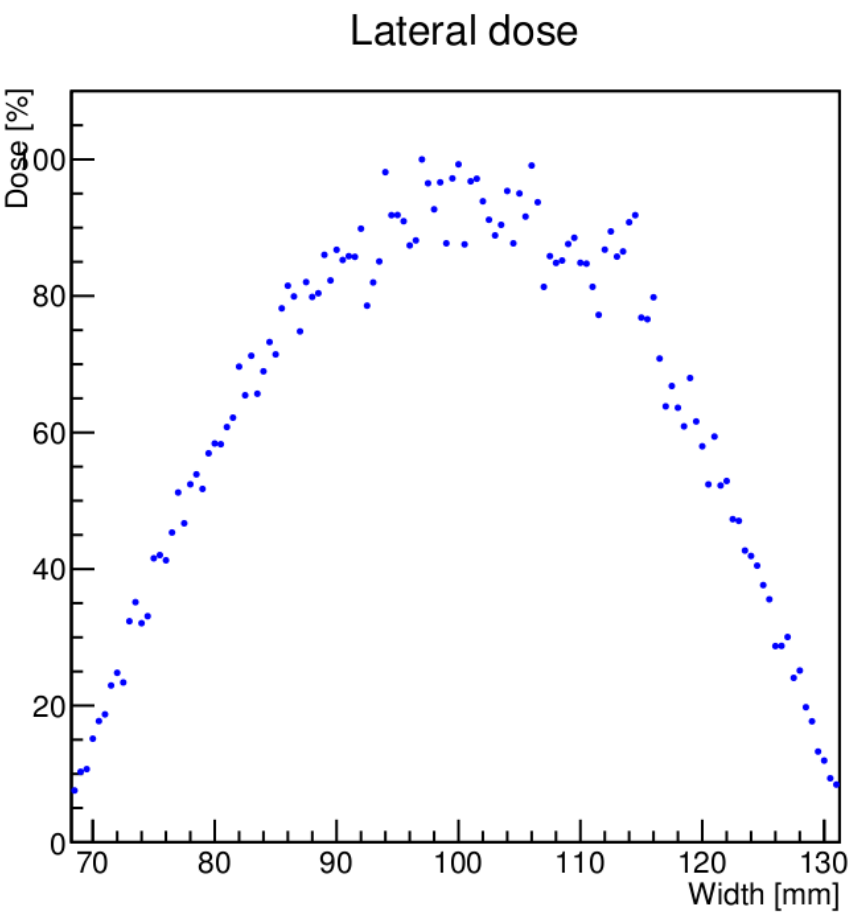
Monitor chambers (1150.02 mm from source)



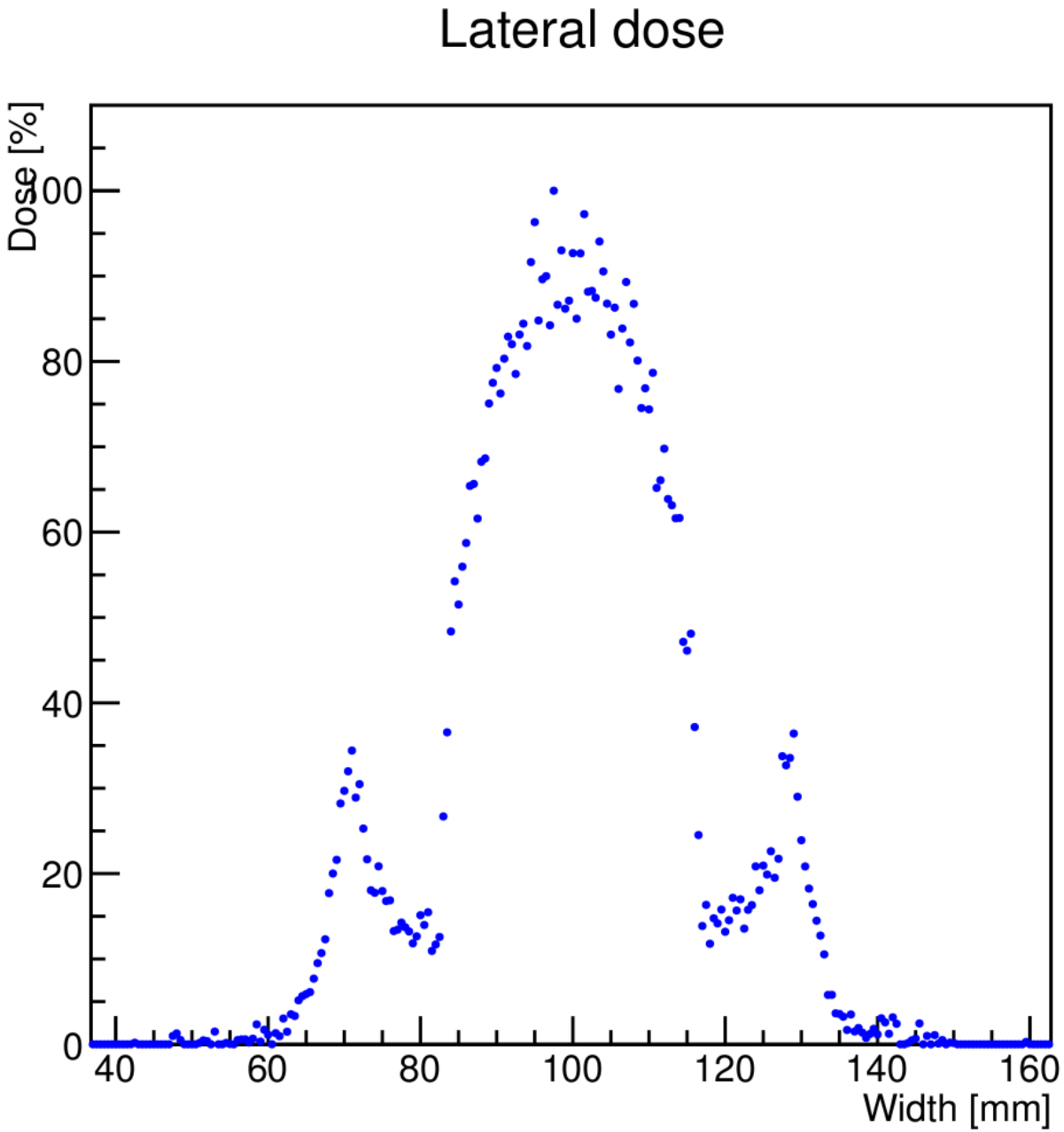


Before Nozzle (1692 mm from source)

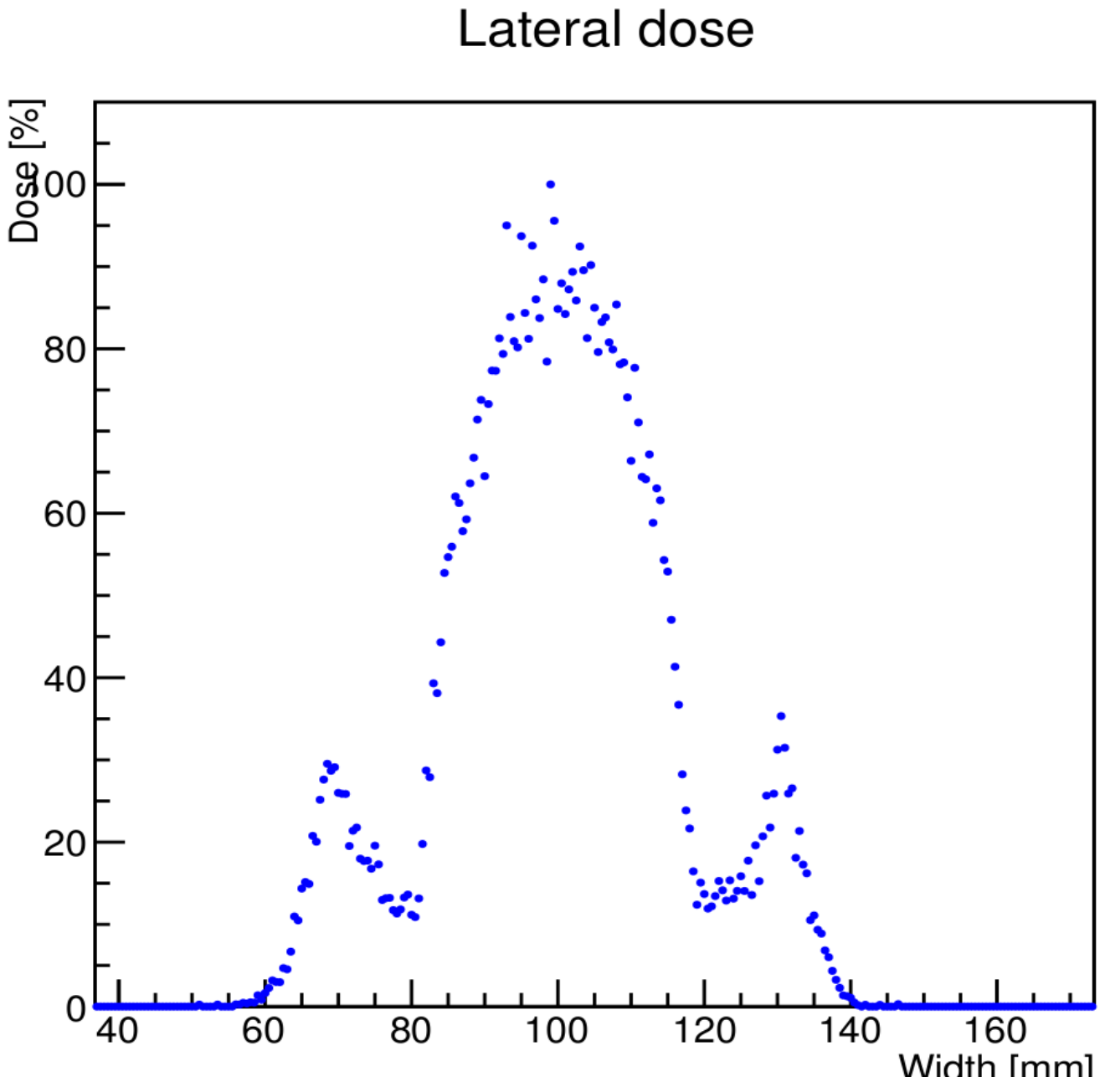


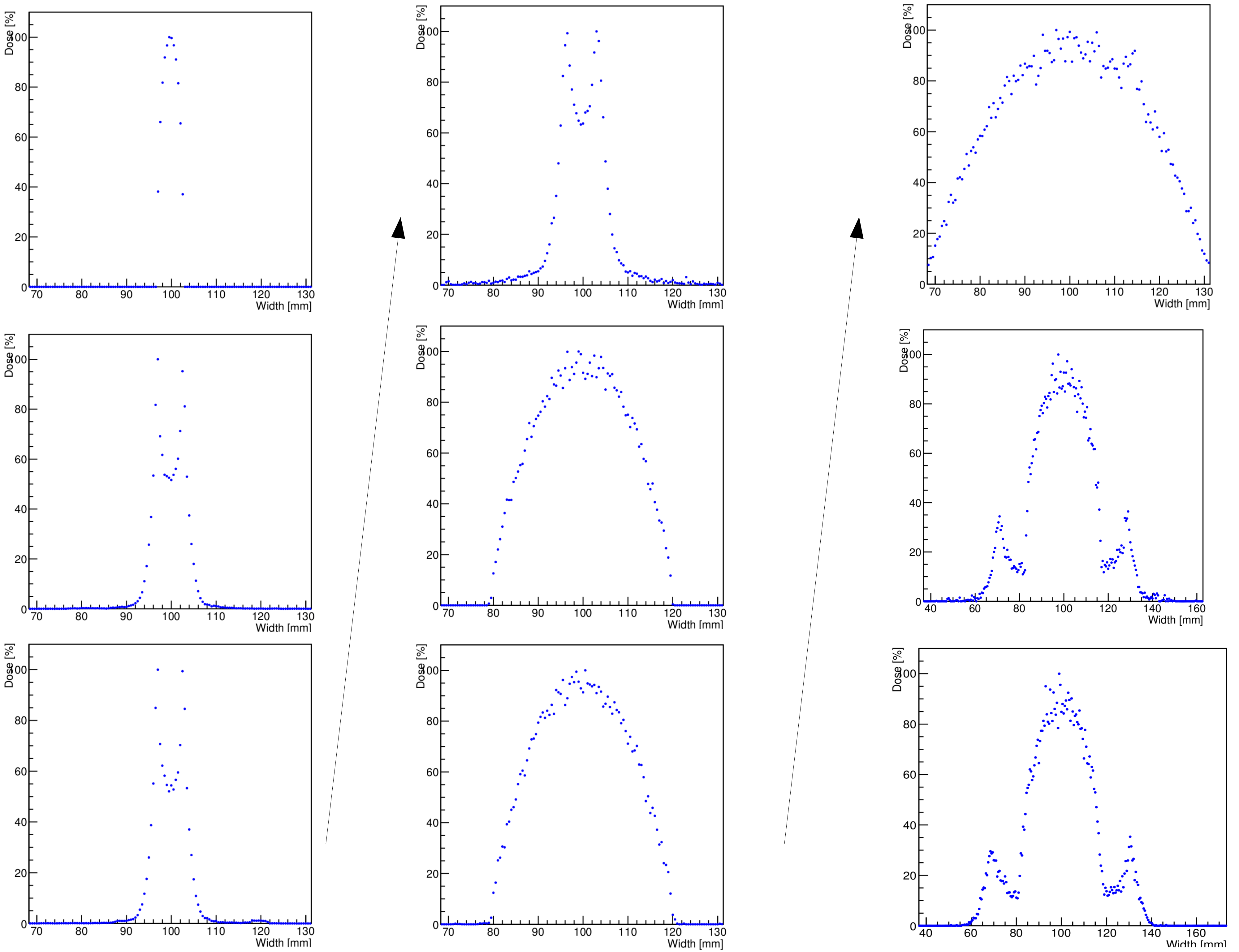


After Nozzle (1766.5 mm from source)



Lateral dose at Bragg peak (water depth 31 mm)





Dose [%]
Width [mm]