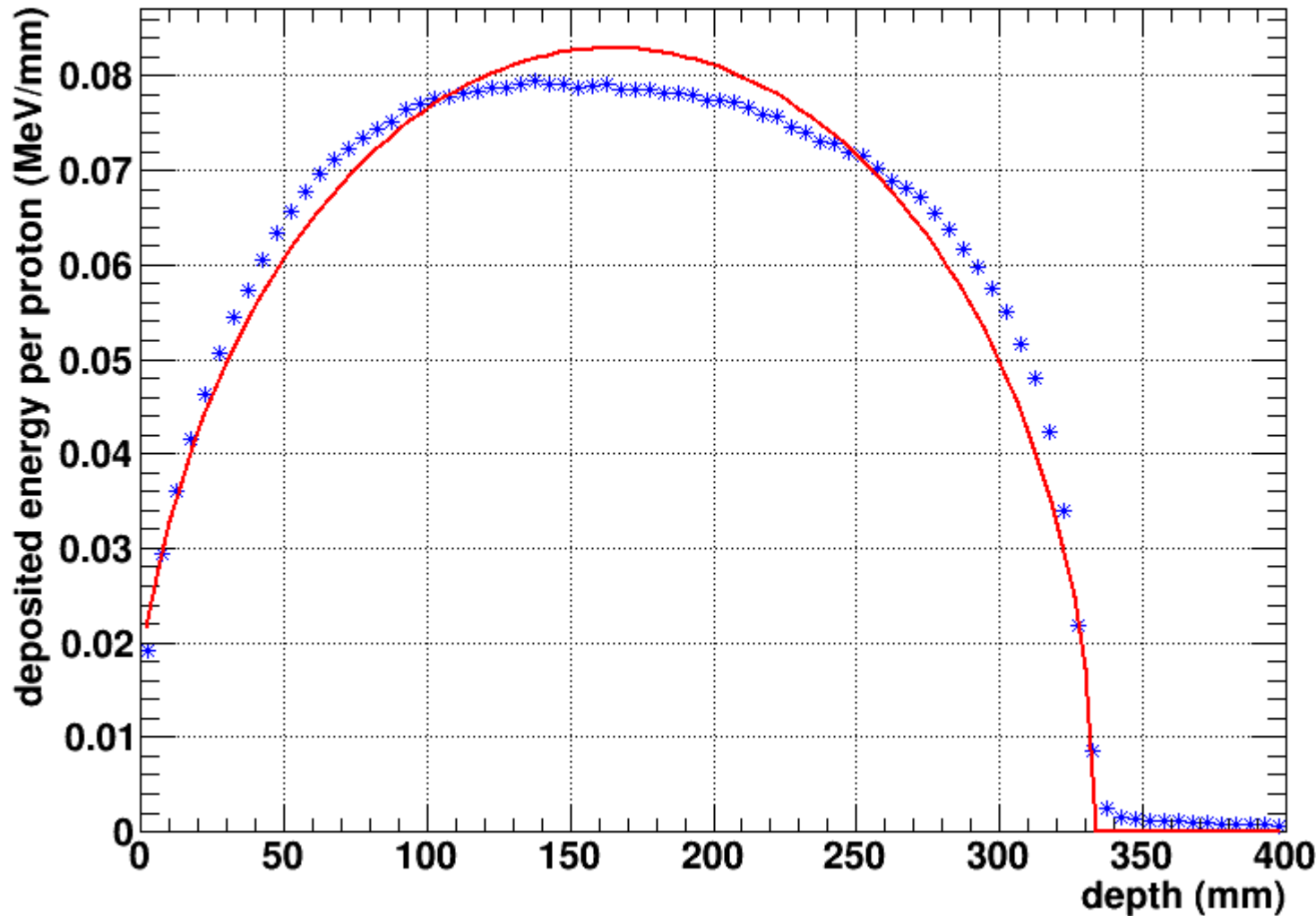


Fit Bragg/Photons including nuclear buildup

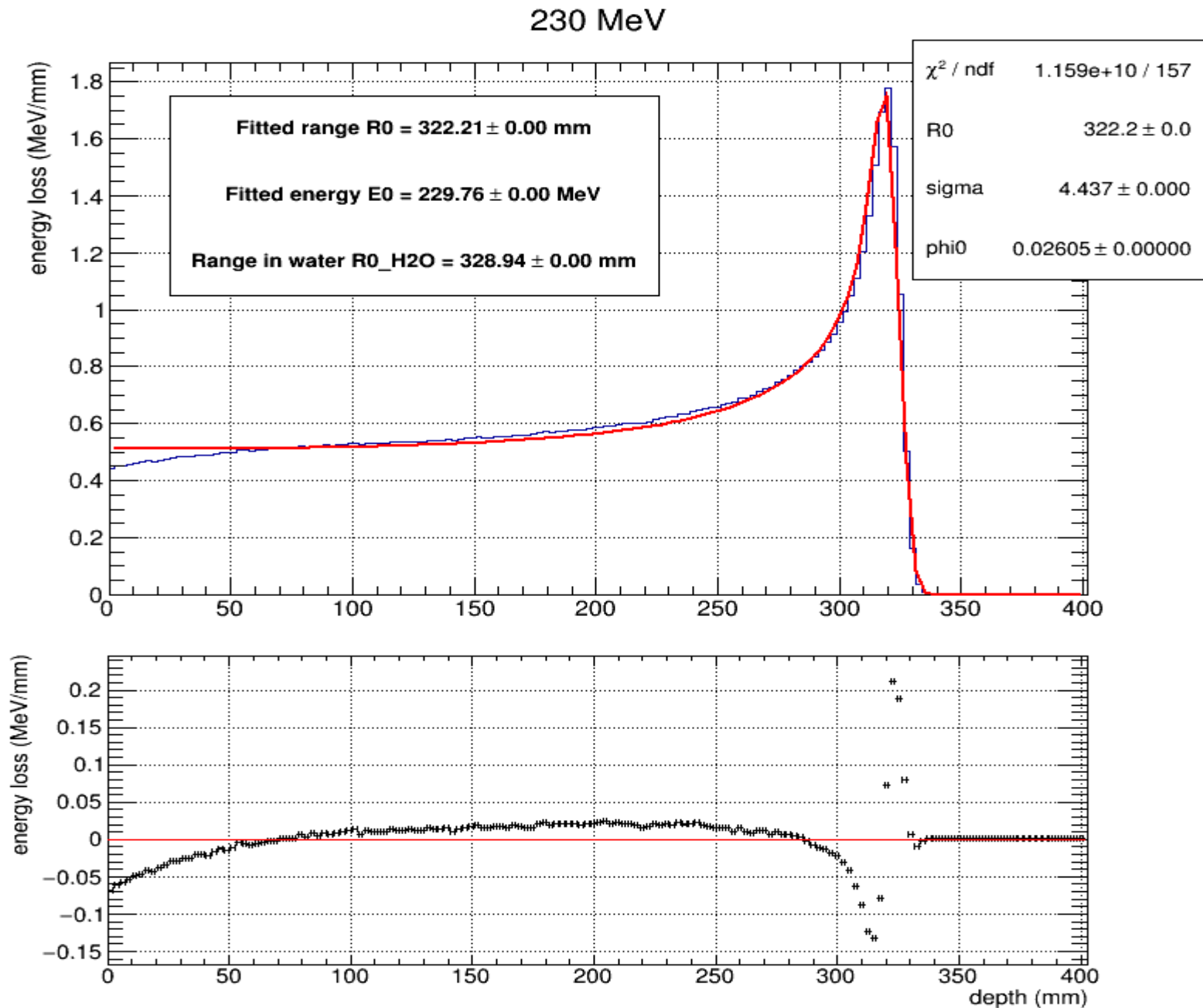
Starting point: Secondary energy deposition looks a bit like ellipse



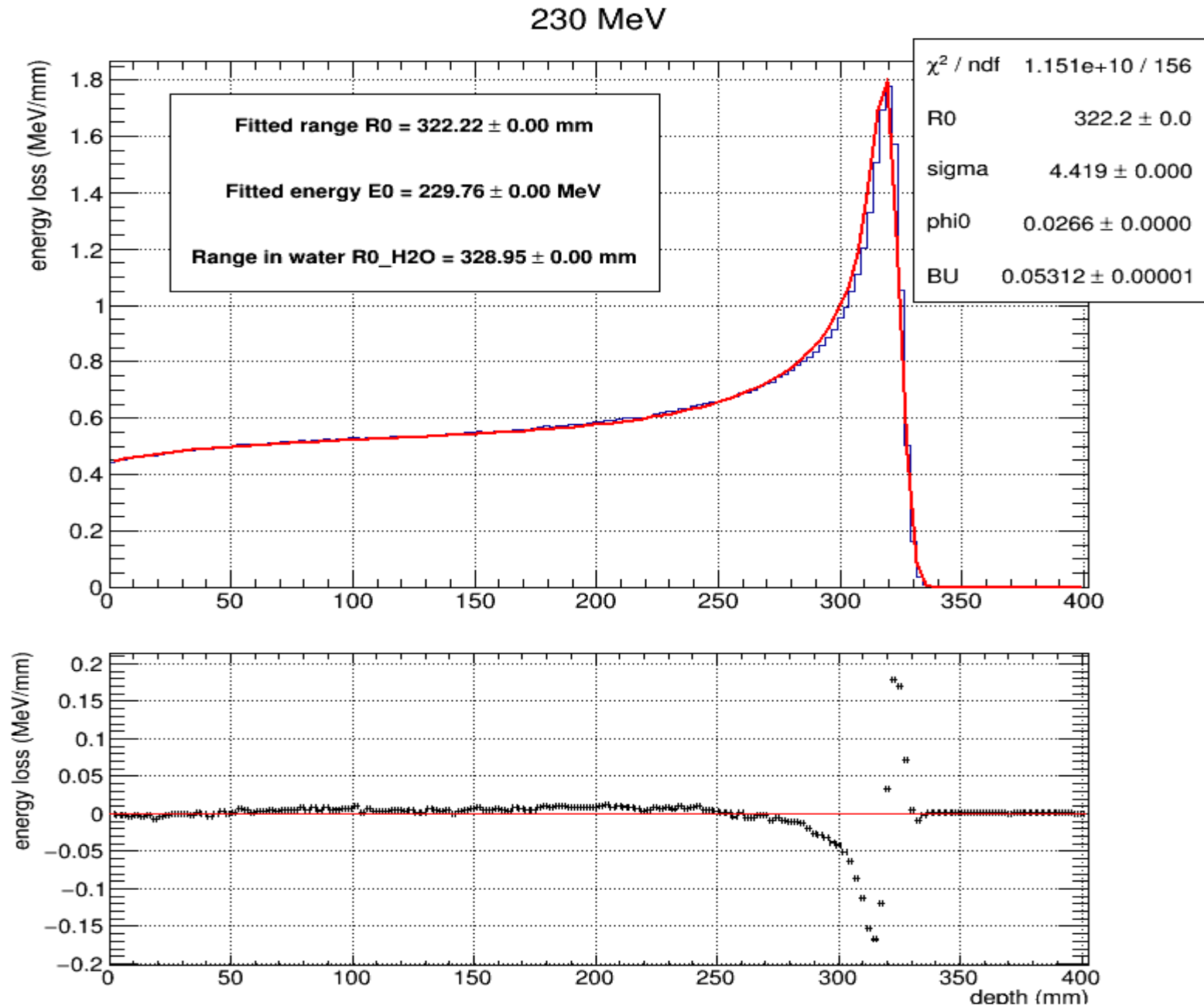
Height is only fitting parameter ("BU")

Width equals range of primary protons
(not a fitting parameter)

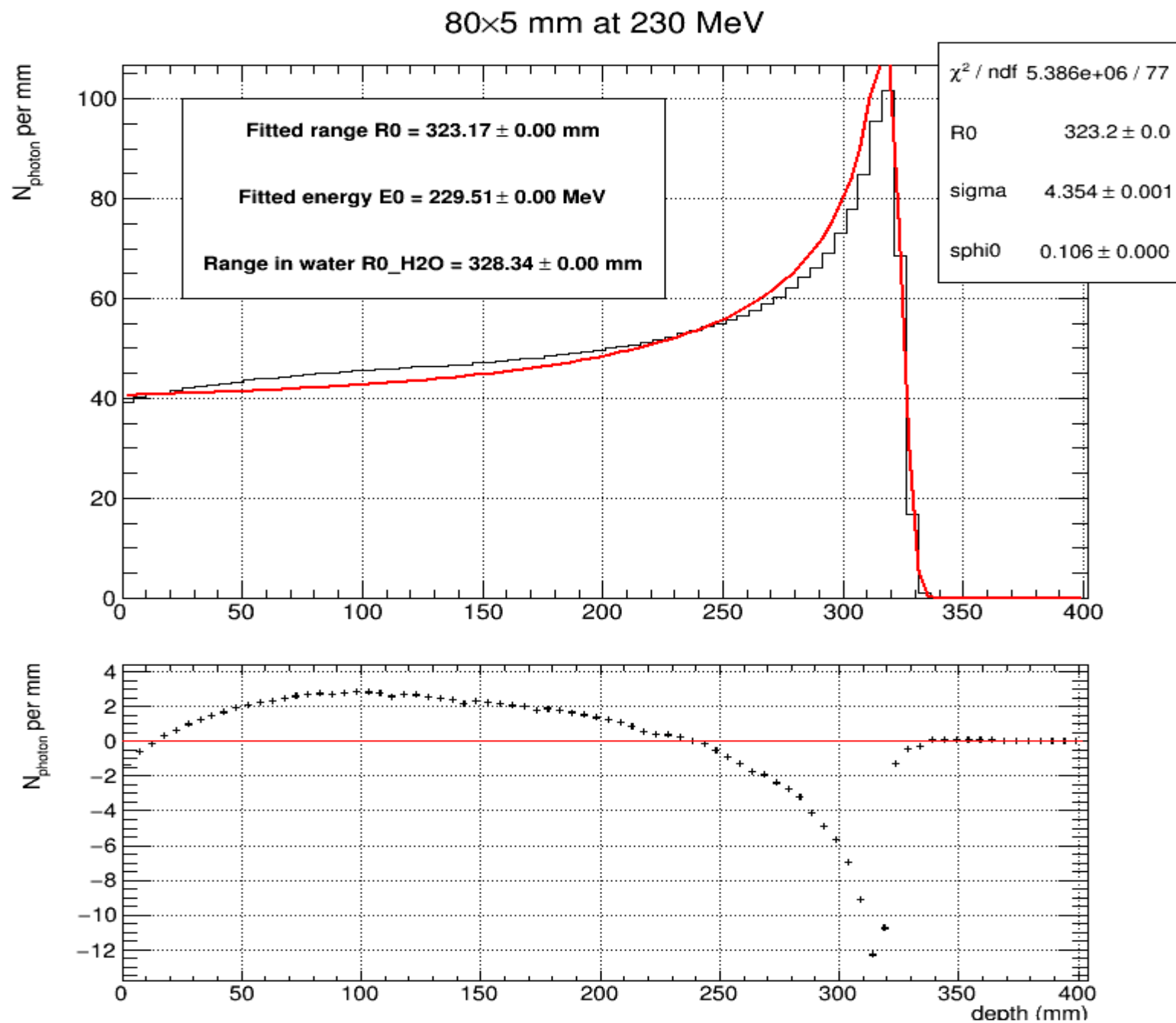
Bragg fit without nuclear buildup (Bortfeld)



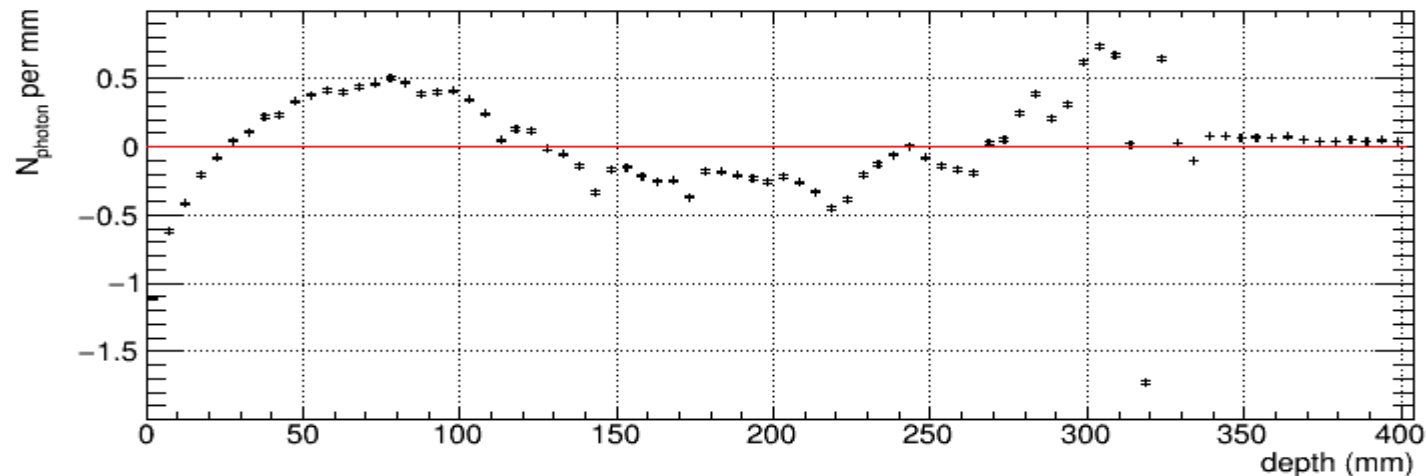
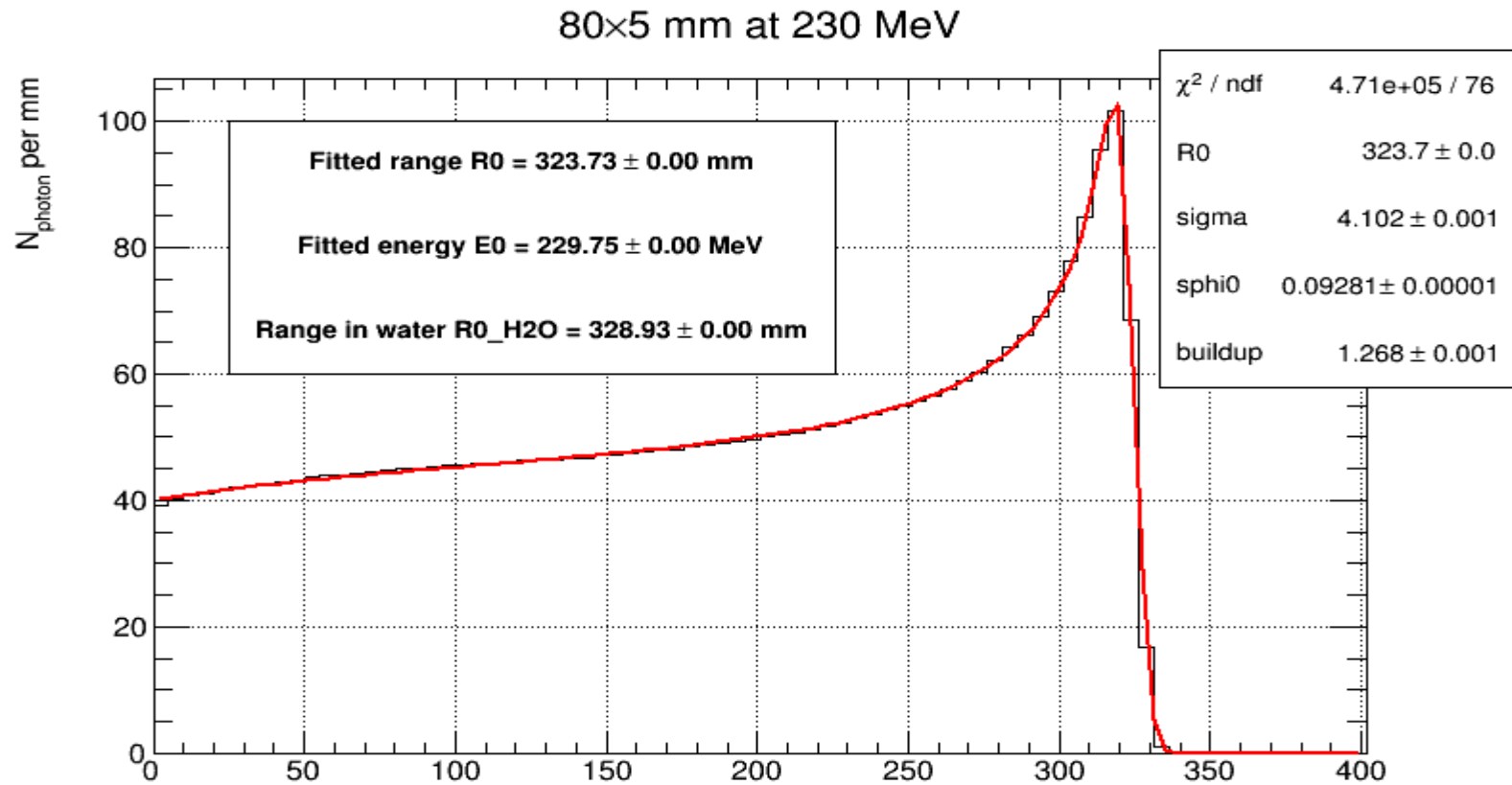
Bragg fit with one additional parameter for nuclear buildup (subtract quarter of ellipse)



Photon fit without nuclear buildup (modified Bortfeld)



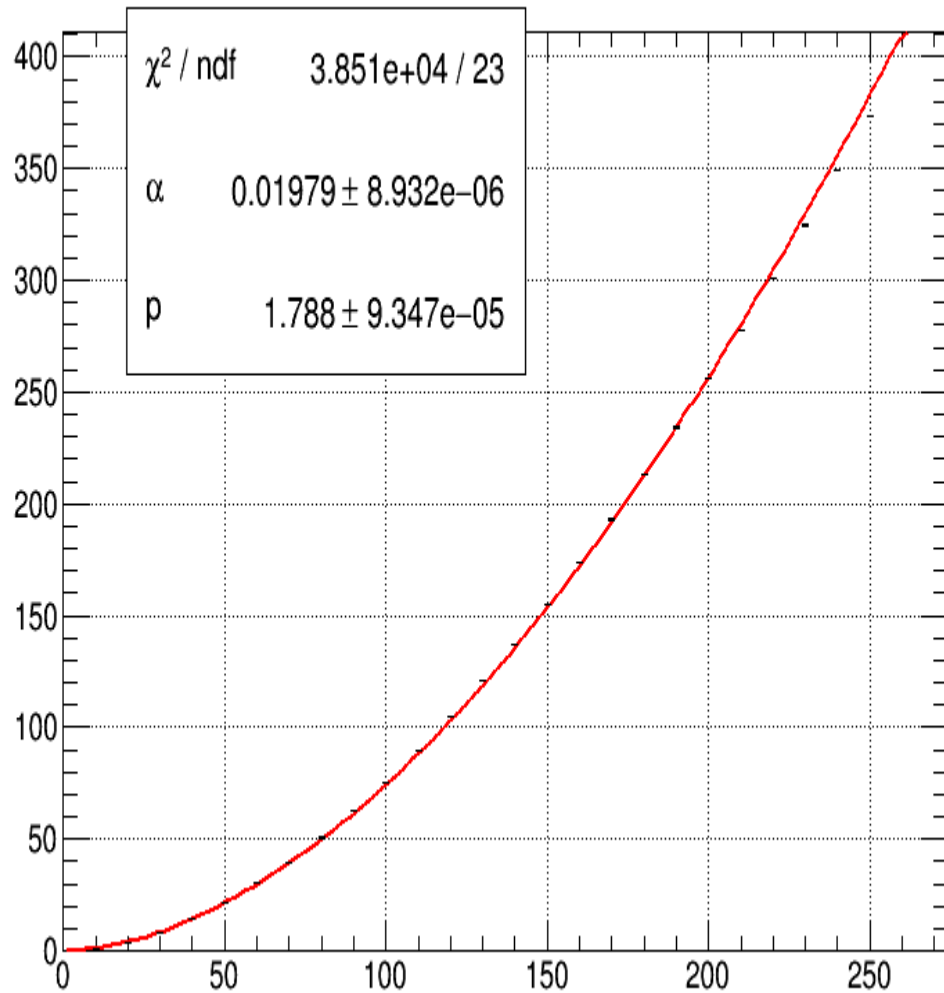
Photon fit with nuclear buildup (add shifted ellipse)



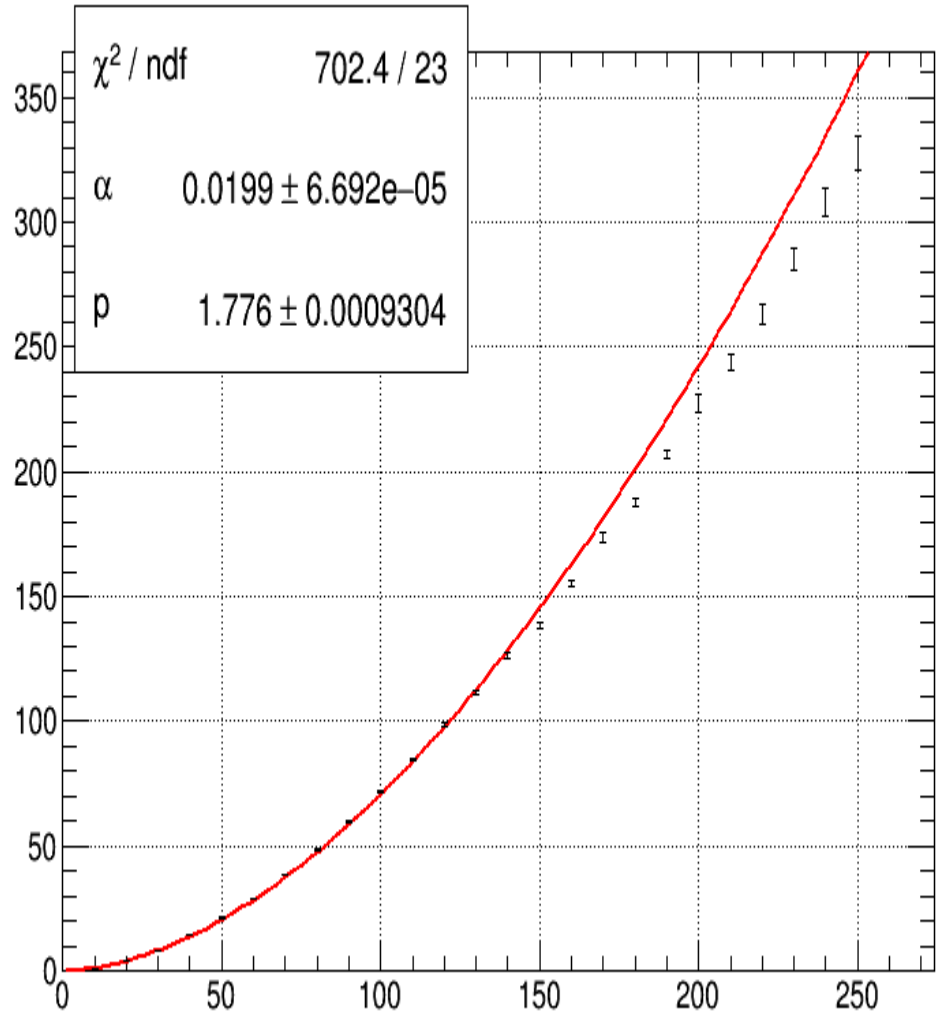
Range-energy conversion

- To do the conversion between range and energy of protons, I simulate a couple of protons at different energies and take the mean of the stopping points
- Doing this INCLUDING nuclear reactions gives highly underestimated values for range for high proton beam energies!
- Only if one deactivates nuclear reactions, the primary proton energy is reconstructed correctly ...
- ... even though in reality, only a fraction of the primary protons makes it to the very end of the Bragg curve

Without nuclear reactions



With nuclear reactions



Conclusion: for simulation of range-energy conversion tables,
DEACTIVATE nuclear reactions (even though that's weird)