

Simulation Updates

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WP6 Meeting

08th July 2023



ROYAL
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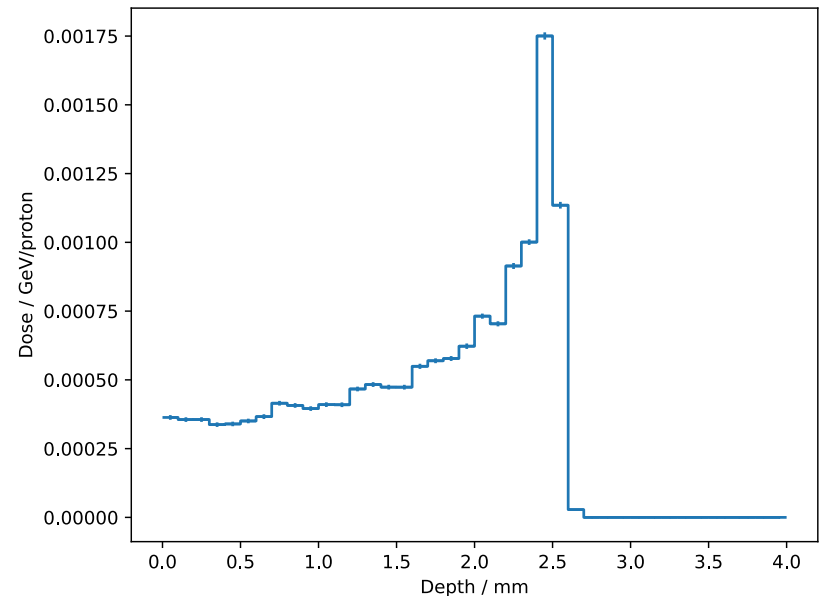
- HT's data:
 - Water volume ONLY
 - No vacuum window, scintillation fibers, cell plate, etc...
 - Unknown dimensions
 - Collimator info not stored
 - "clean" dose map
 - "10⁹ protons simulated into the chamber"
 - Highly doubt, most likely 10k scaled.
 - 1.0 cm spot size
 - 2 σ diameter
- Re-analysing the data:
 - Ion chamber depth: 2 mm
 - Depth dose curve length ~ 2.5 mm
- Ongoing

```
Model:
waterphantom: type=rcol, l=0.13, mat=G4_WATER

Beam def.: distrType: gausstwiss
: particle: proton energy:0.95327231
: betx = 46.0 bety = 46.0 alphax=0.0 alphas=0.0 emitx=1.37e-07 emity=1.37e-07
: dispX= 0.0 dispY= 0.0 sigmaE=0.0 sigmaT=0.0
: sigmax=2.51E-03 sigmay=2.51E-03 sigmaxp=5.46E-05 sigmayp=5.46E-05

Prim dist: particle: proton
: n: 1.00E+00
: E: 9.53E-01 +/- 0.00E+00
: x: -3.96E-05 +/- 2.51E-03
: y: 2.95E-05 +/- 2.49E-03
: xp: -3.50E-07 +/- 5.48E-05
: yp: 6.36E-07 +/- 5.41E-05
: t: 0.00E+00 +/- 0.00E+00

Options: horizontalWidth: 0.6
: physicsList: g4QGSP_BERT
: samplerDiameter: 0.1
: stopSecondaries: 0
: integratorSet: geant4
: aper1: 0.05
: beampipeThickness: 0.005
: storeTrajectory: 1
: storeTrajectoryParticle: proton
: storeFlossLocal: 1
: storeFlossGlobal: 1
: storeFlossLinks: 1
```



- Done:
- Ongoing:
 - Optimisation routines for smaller spot sizes
 - Optimisation validation for smaller spot sizes
 - Reconstructing HTs end station simulations
 - Comparison to baseline design
- Todo:
 - Performance evaluation of $\pm 5\%$ beams
 - No optimisation. Transport & transmission assessment.
 - Alternative space charge codes & model validation.
 - RF-track, OPAL, IMPACT-T, ...?
 - Update models of alternative baseline design (v5.5)
 - Develop OPAL model of FFA