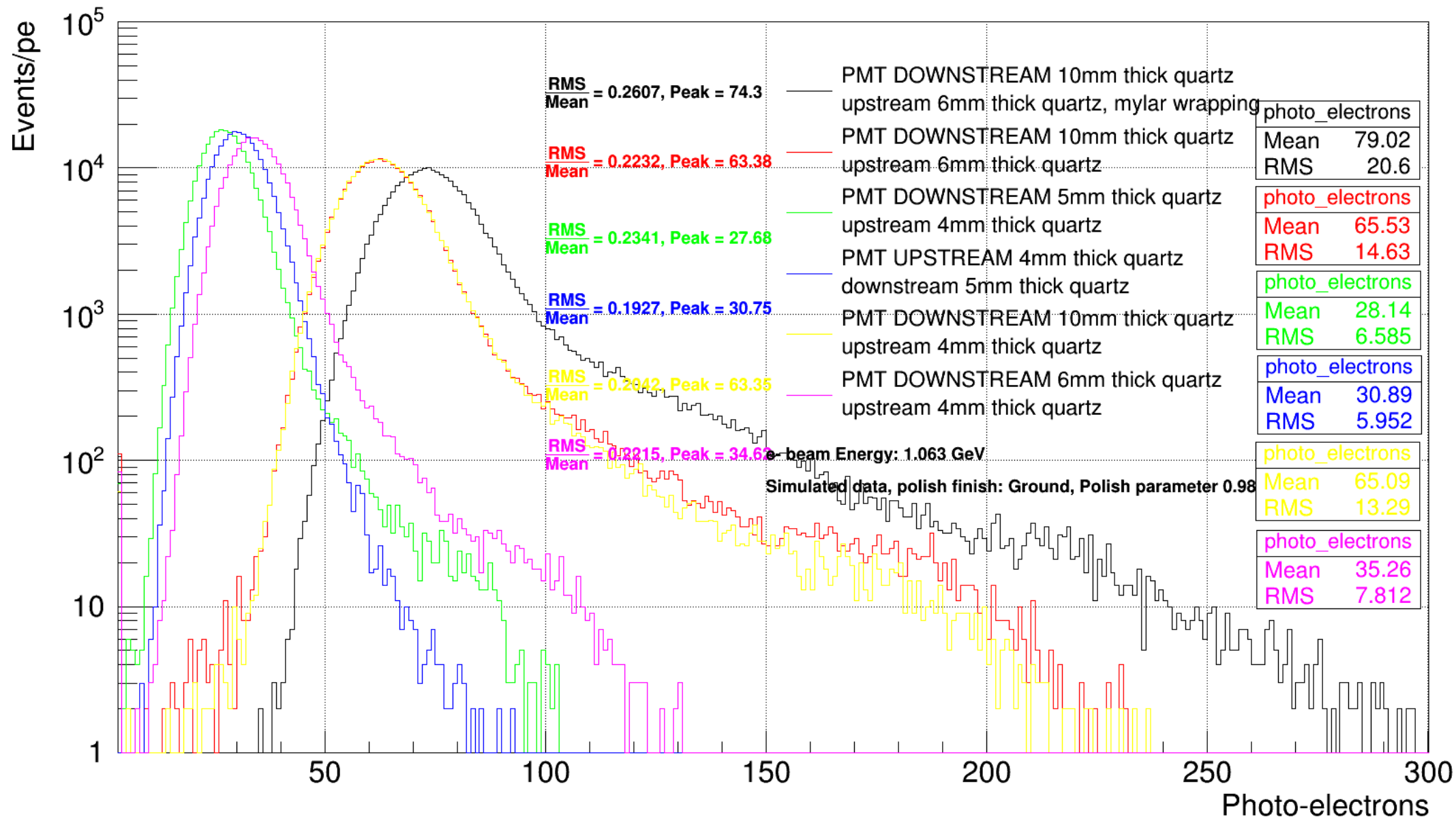


# PREX-II(/CREX) Tandem Detector Quartz Thicknesses

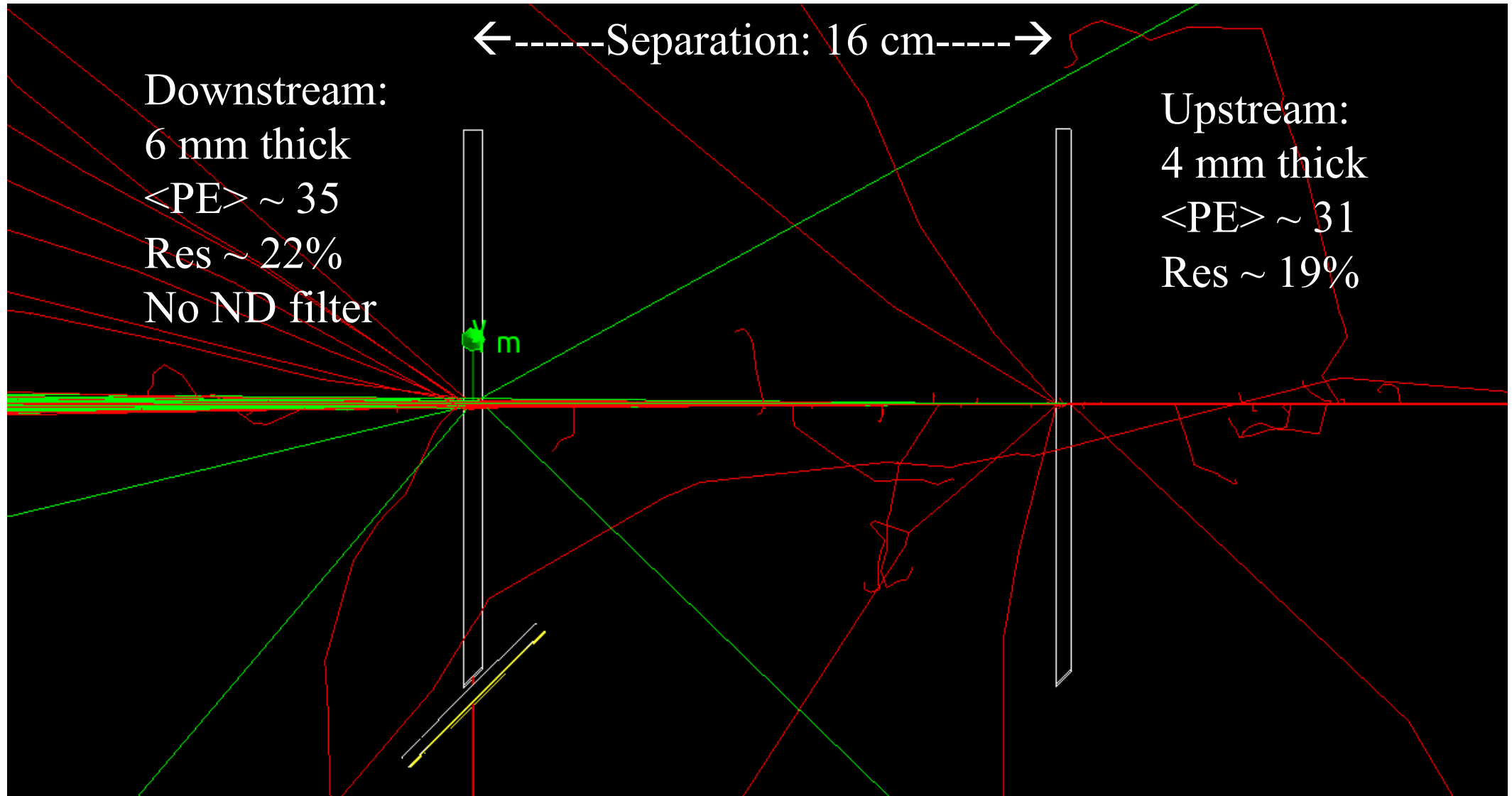
Dustin McNulty

Aug 28, 2018

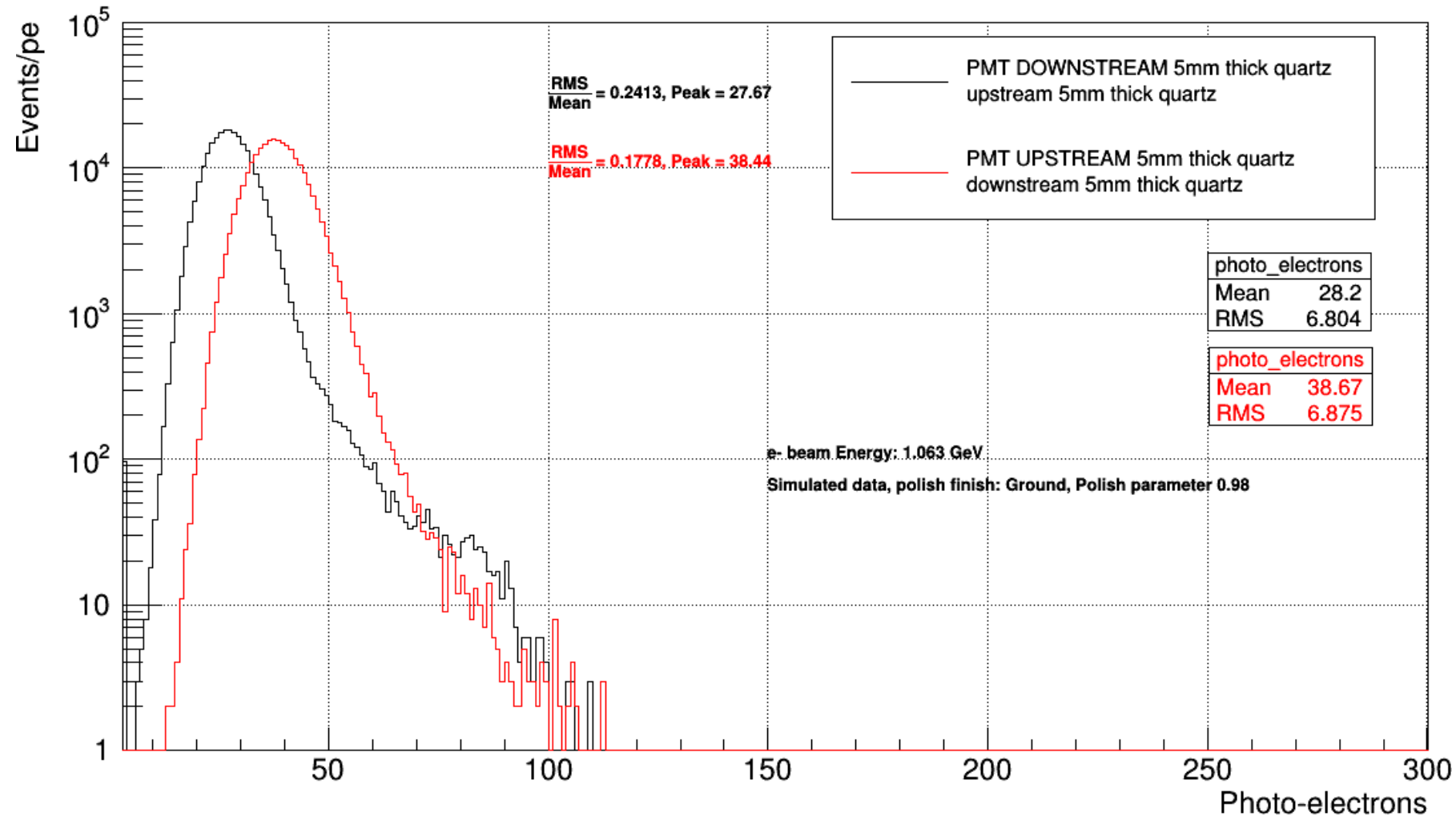
# Photo-Electron Distribution - PREX-II Tandem Mount



# Qsim Event Visualization



## Photo-Electron Distribution - PREX-II Tandem Mount



- It seems that multiple scattering causes significantly lower PE yields for downstream quartz (due to incident angle sensitivity) – this conclusion needs some verification

## Summary

- 4 mm thick upstream quartz light yields: 31 PE's/e<sup>-</sup> gives ~9 nA light level on PMT cathode
- 6 mm thick downstream quartz light yields: 35 PE's/e<sup>-</sup> gives ~10 nA light level on PMT cathode
- These light levels are at the edge for achieving good non-linearity and will likely require us to do an asymmetry correction to reach our 0.3% systematic error goal
- How accurate is simulation? We have a 6mm thick already in hand (from PREX-I). We could purchase a 4 mm thick piece (order by mid-Sept) and benchmark the simulations at SLAC this Dec.