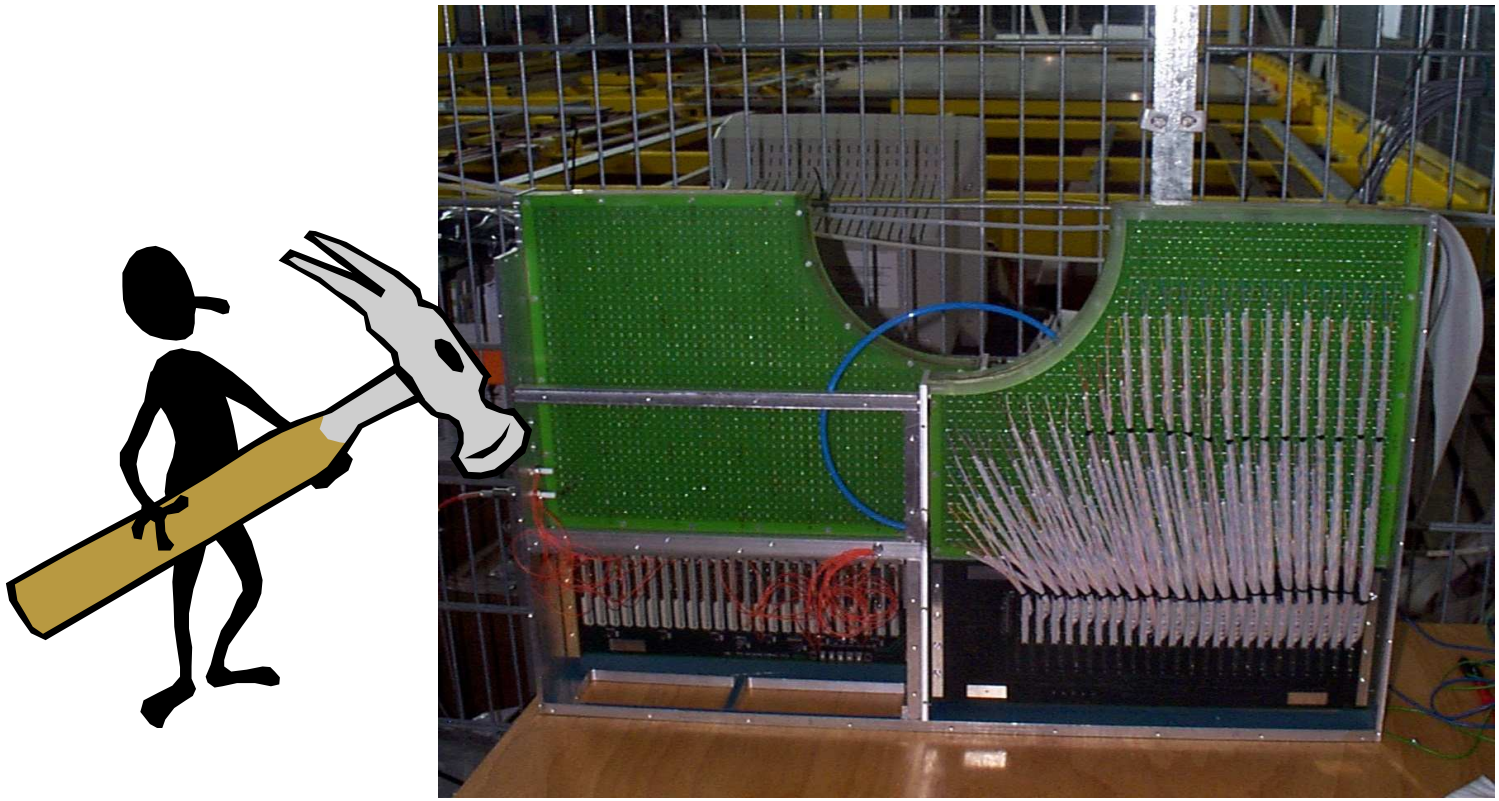
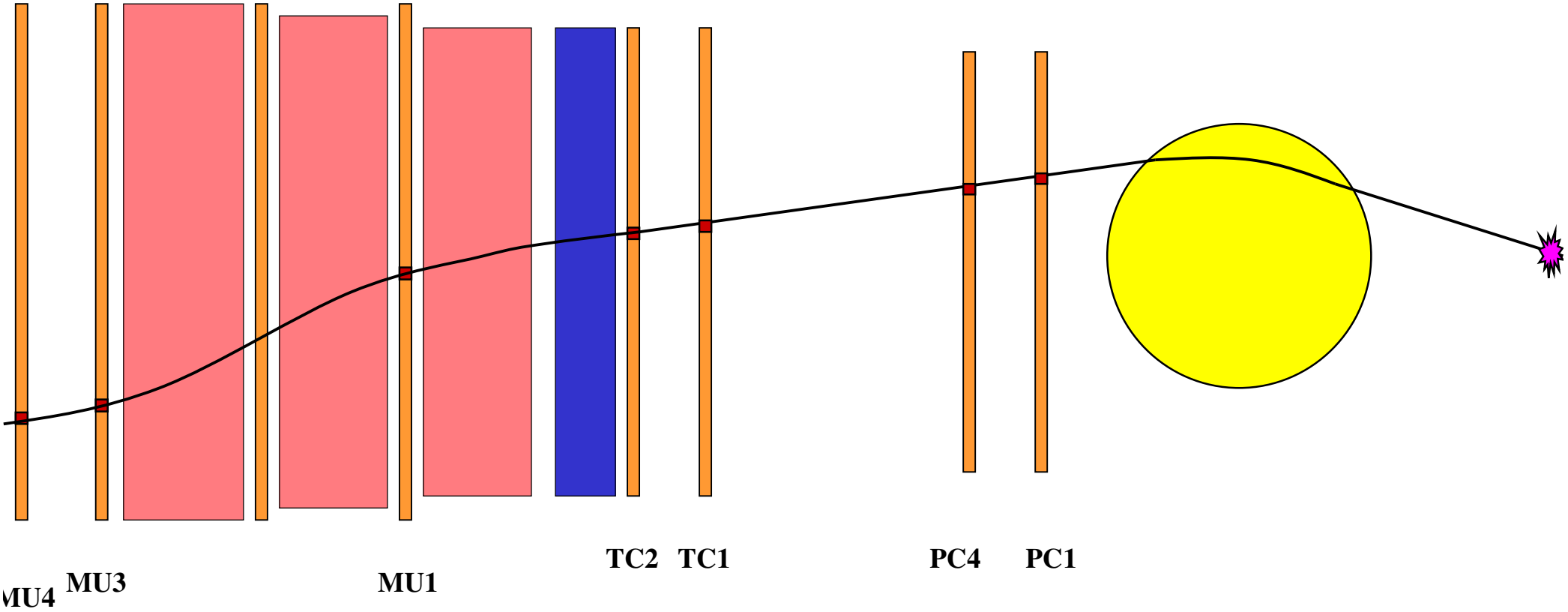
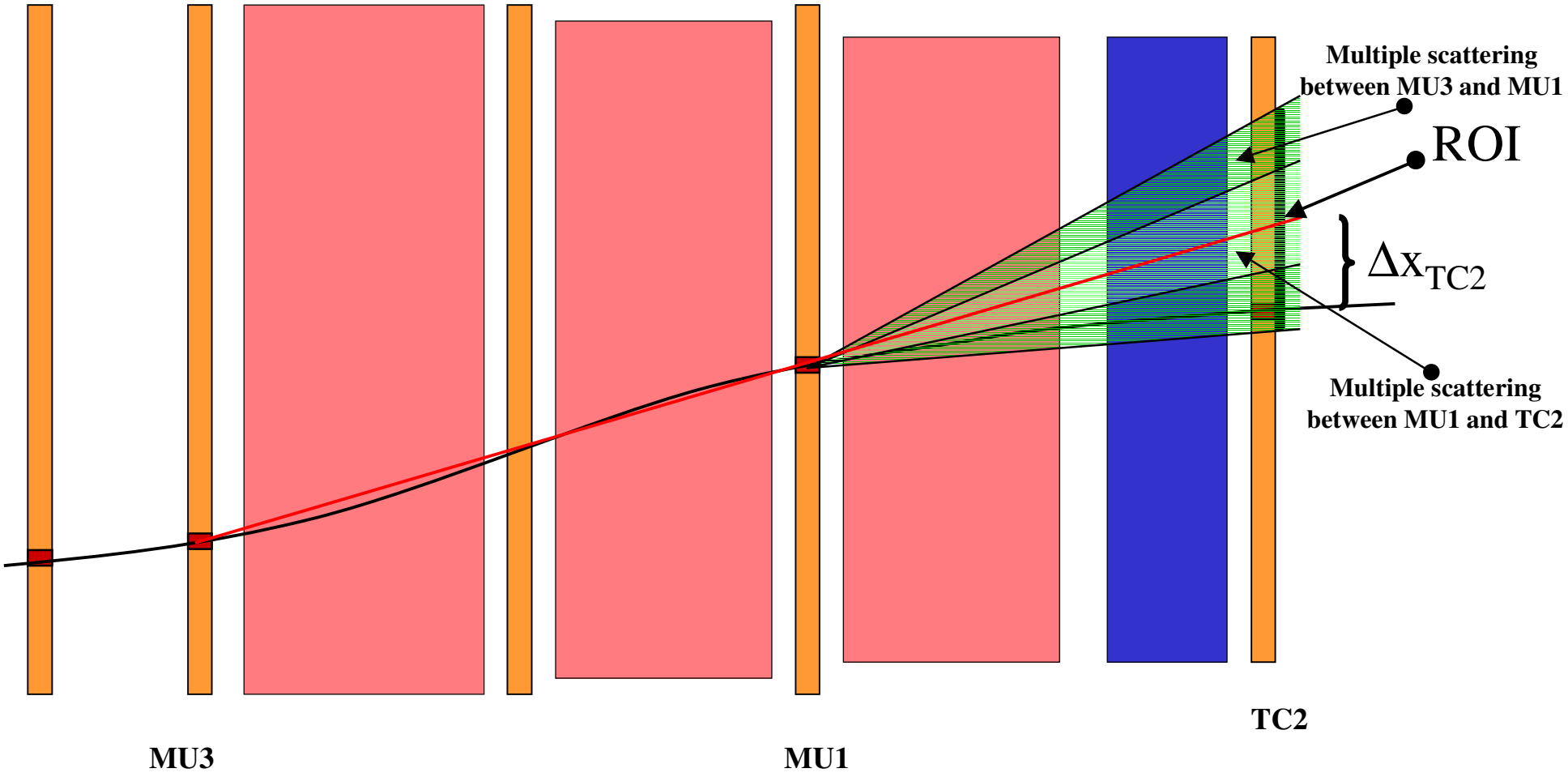
One another approach for FLT muon track extrapolation procedure to reduce the electronics of MX1 chambers



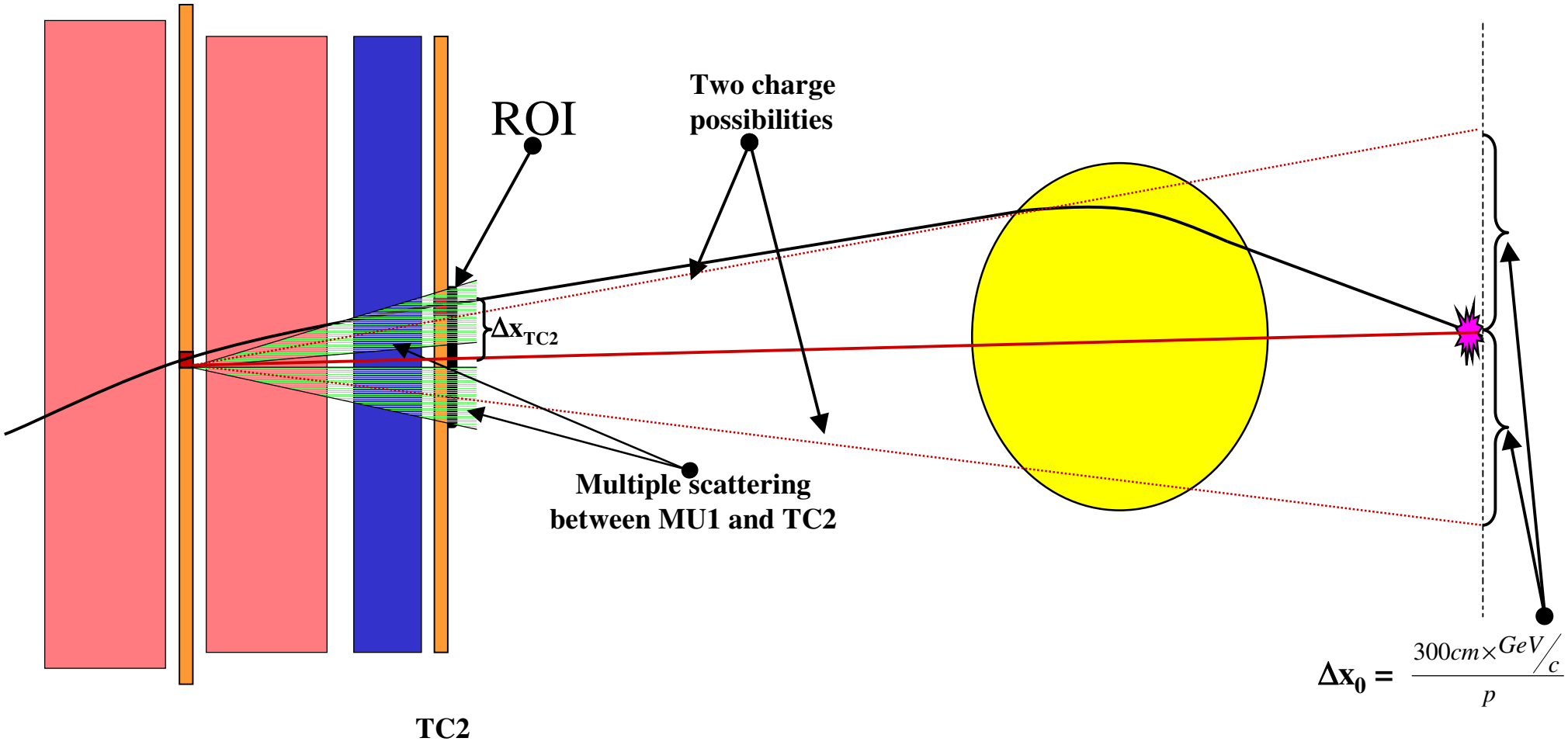
Muons track: FLT view



TDR scheme: MU3 + MU1 to TC2



Modified scheme: direct MU1 to TC2

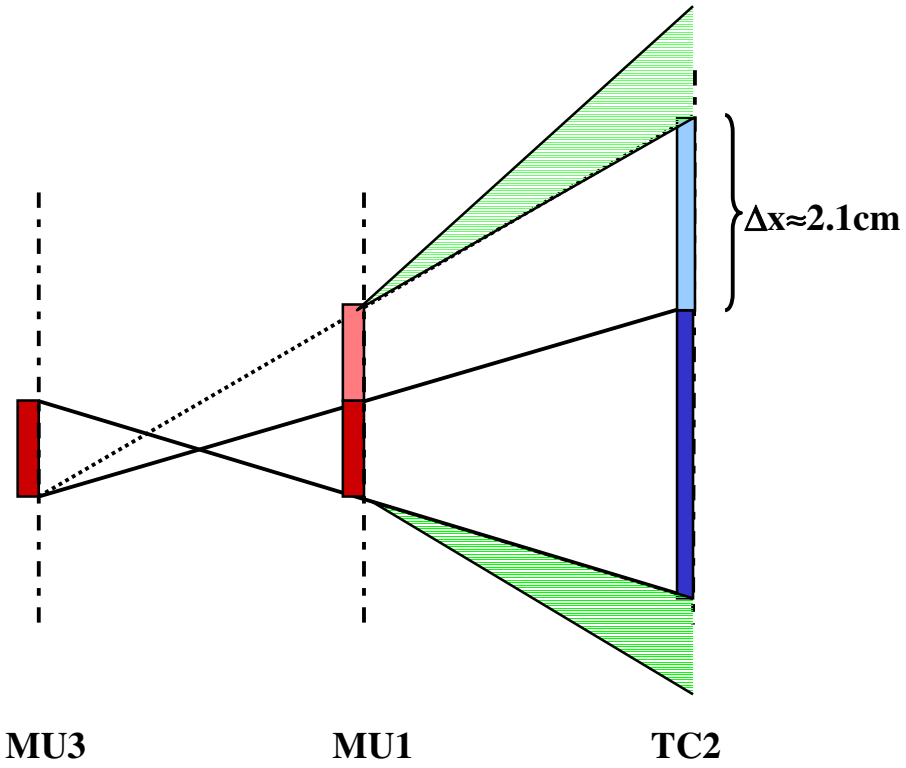


Contributions to the TC2 ROI size

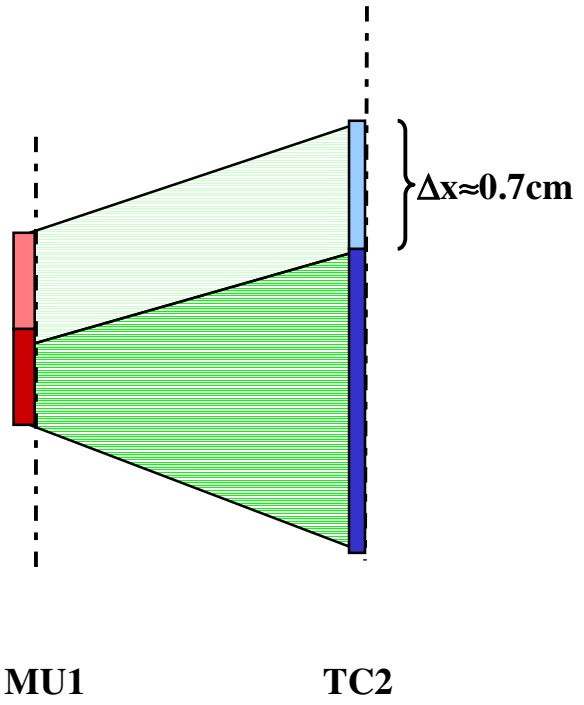
- MU3 + MU1
  - multiple scattering between MU3 and MU1
  - multiple scattering between MU1 and TC2
  - hit sizes in MU3 and MU1
- MU1 + kinematics restriction
  - multiple scattering between MU1 and TC2
  - uncertainty in particle charge and momentum
  - hit size in MU1

Hit size contribution

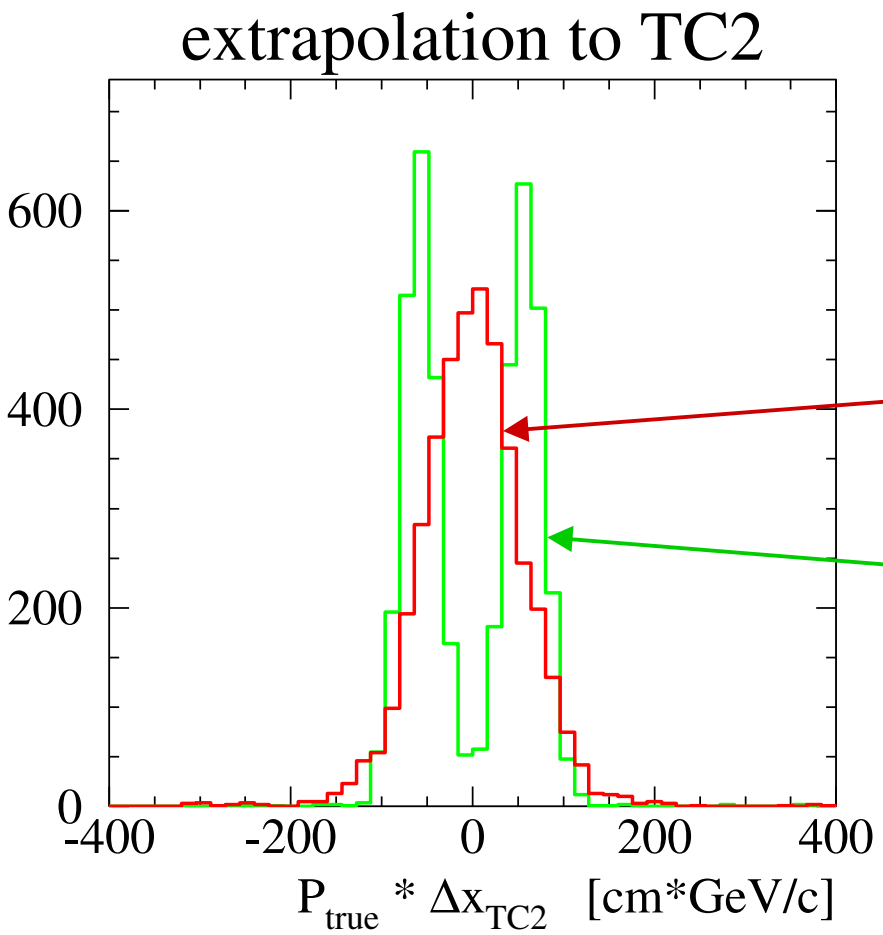
"MU3+MU1"



"MU1+kinematics"

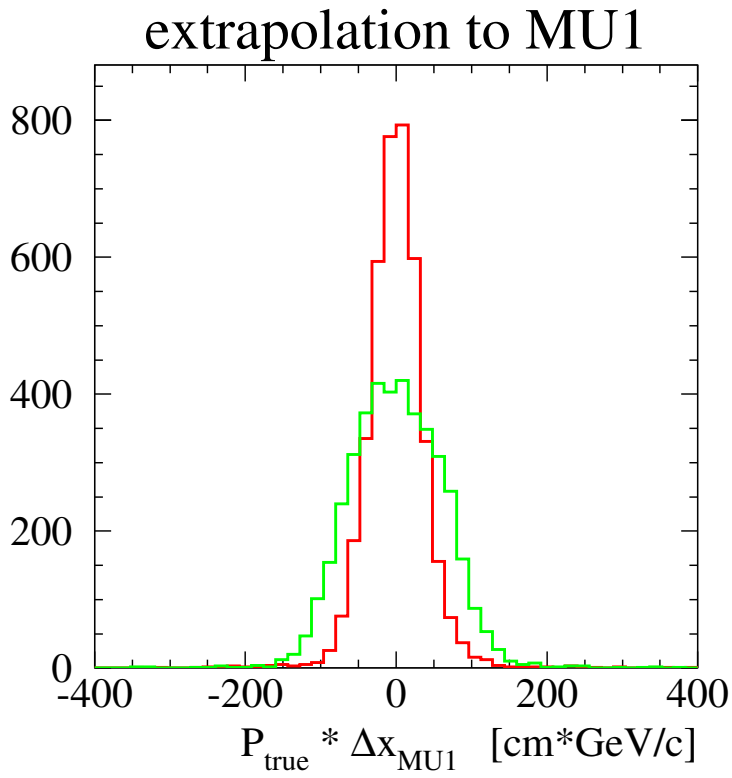


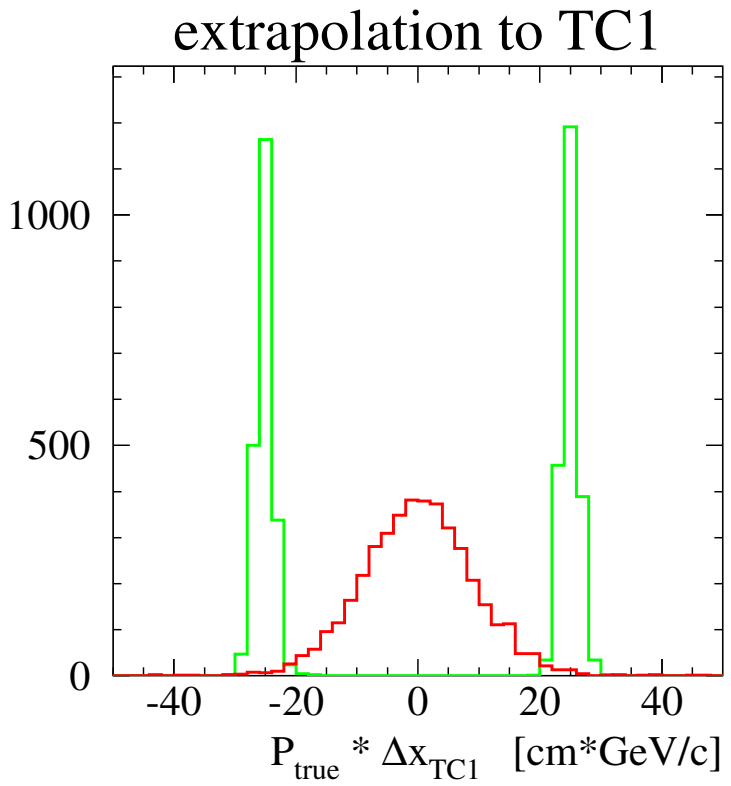
Multiple scattering vs. charge uncertainty



- Both contributions are about the same
- “MU3+MU1” approach has smaller RMS
- “MU1+kinematics” approach has smaller tails

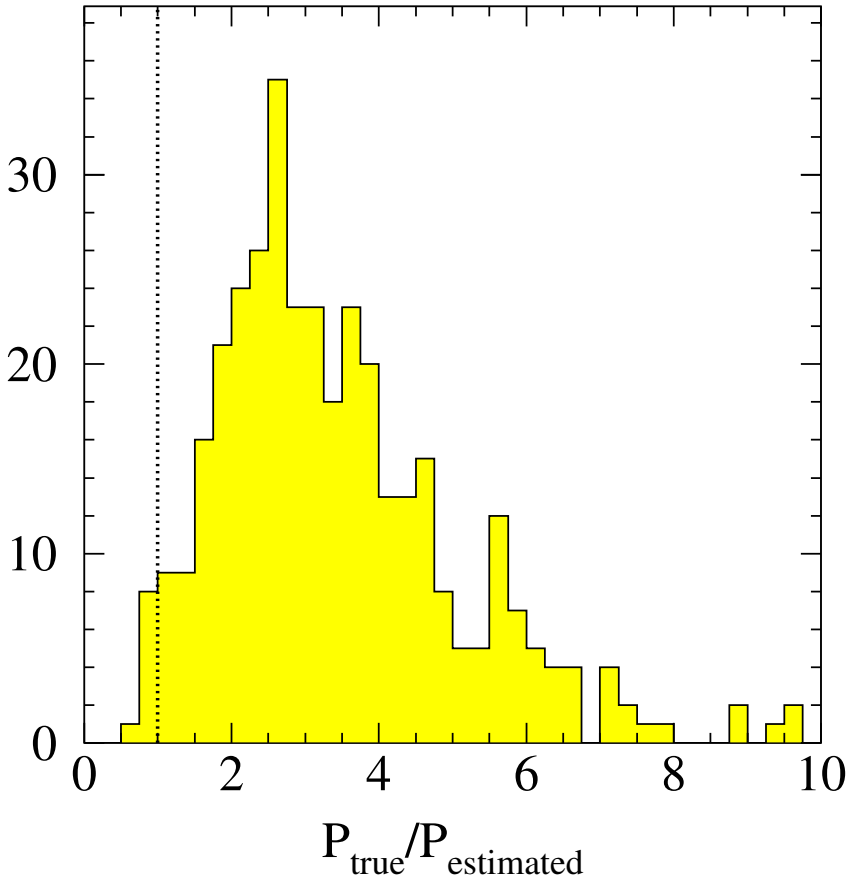
Other layers?





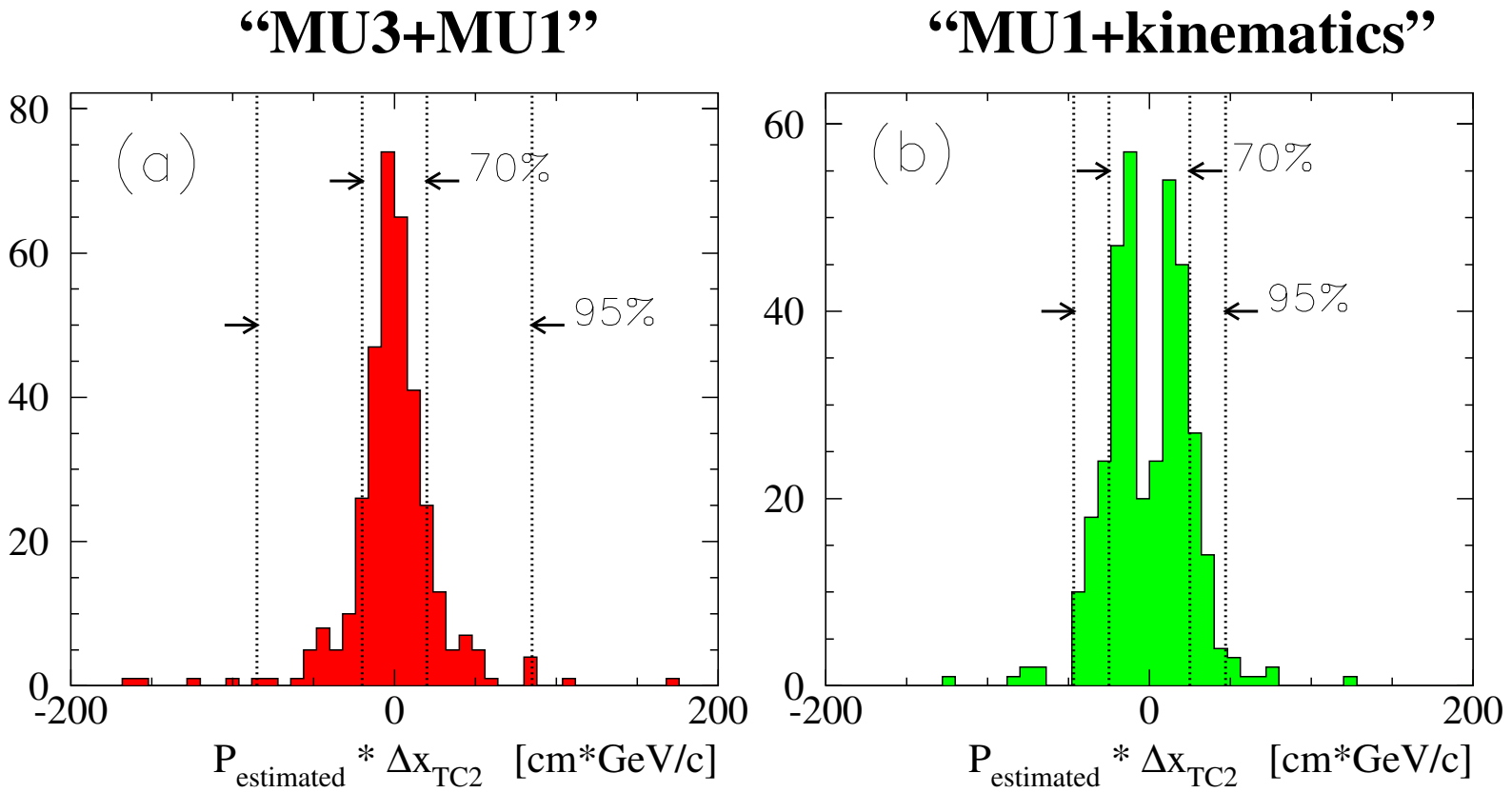
No sense...

Track momentum estimation



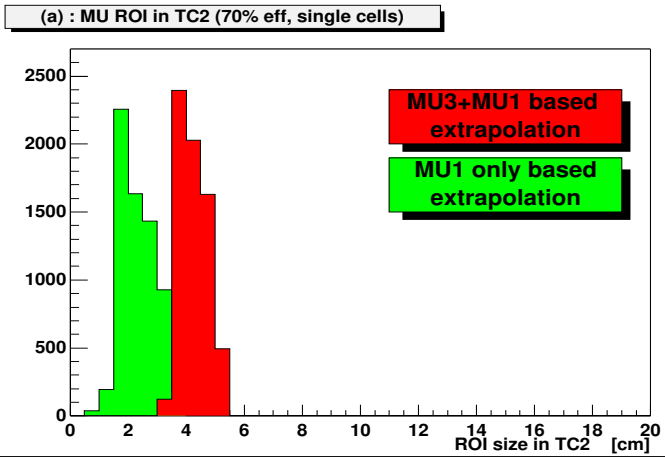
- Momentum value is used to predict multiple scattering contribution and track slope in magnetic field
- Lower limit is actually required
- Use FLT kinematics restriction p_T>0.5 GeV/c: $p>0.5\times z_{MU3}/r_{MU3}$
- μ - track momentum is estimated by the pretrigger and stored in the message

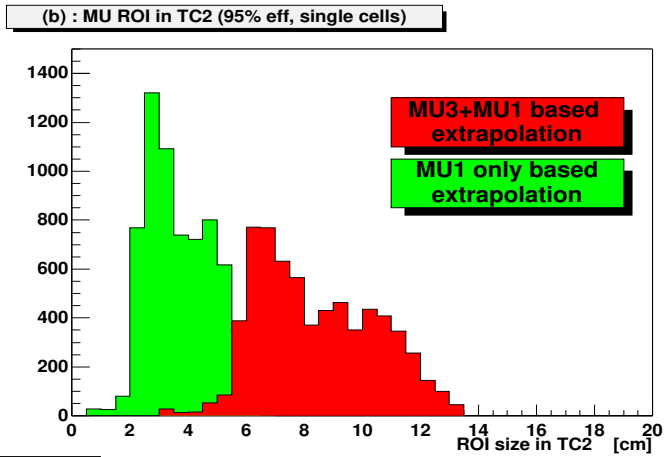
Estimation for track deviation in TC2



- Base approach has smaller RMS
- New approach has smaller tails

Resulting TC2 ROI distribution





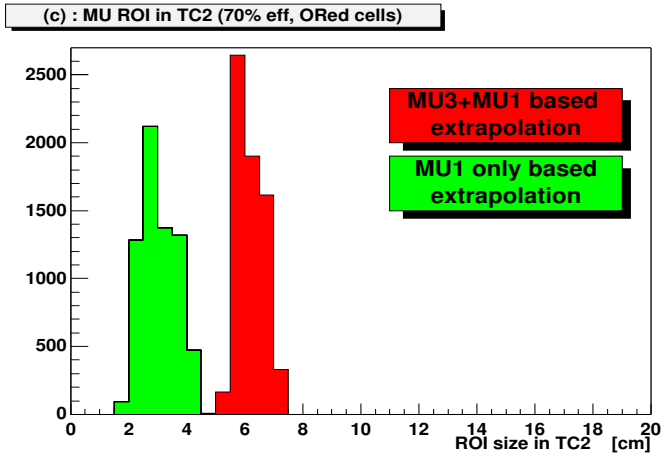
Narrow extrapolation window:
- hit size contribution is essential

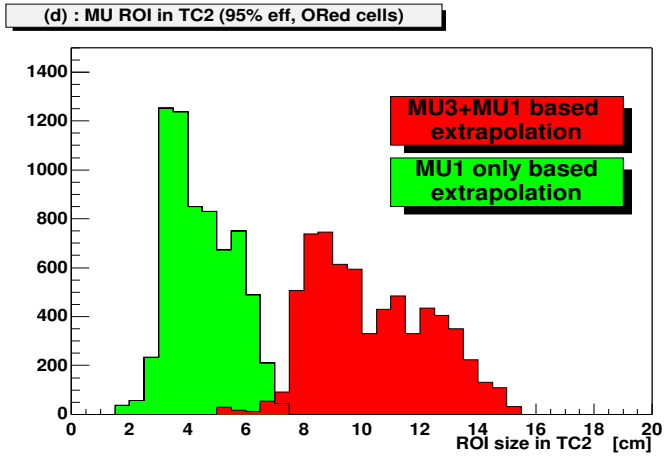
Wide extrapolation window:
- tails contribute more

New scheme looks better in both cases

If MX1 cells are ORed

- TC2 ROI for “MU3+MU1” scheme is increased by 2.1 cm
- TC2 ROI for “MU1+kinematics” scheme is increased by 0.7 cm





The disadvantage of old scheme is aggravated

Conclusion

- New scheme is developed for MU1 to TC2 track extrapolation.
  - **it provides better performance for baseline detector configuration**
  - **it is less sensitive to the size of the cell in the MX1 chamber**
- Horizontal ORing of neighboring cells in MX1 is acceptable for the HERA-B FLT operation if that scheme will be used