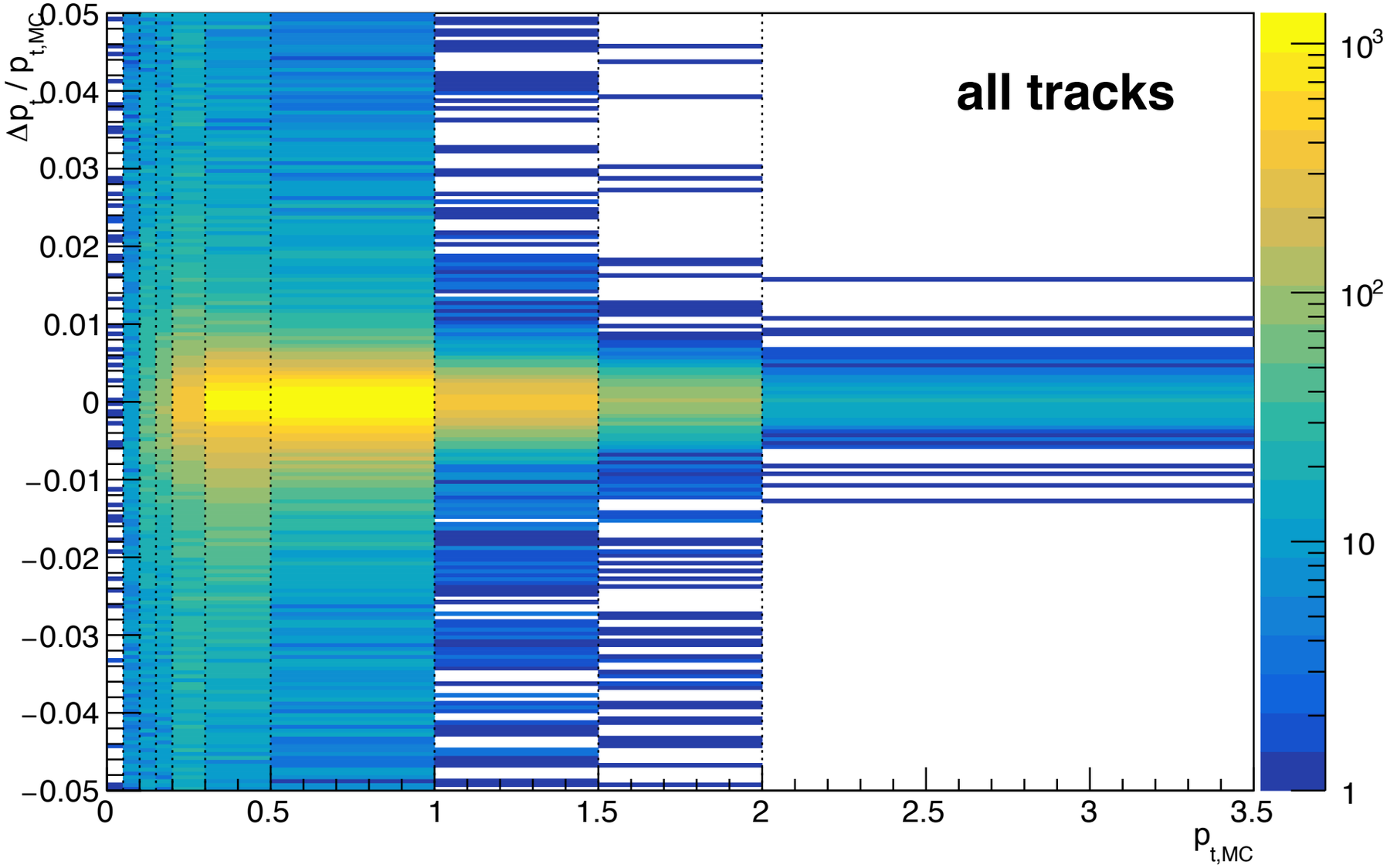
TRACKING PERFORMANCE

p_t resolution

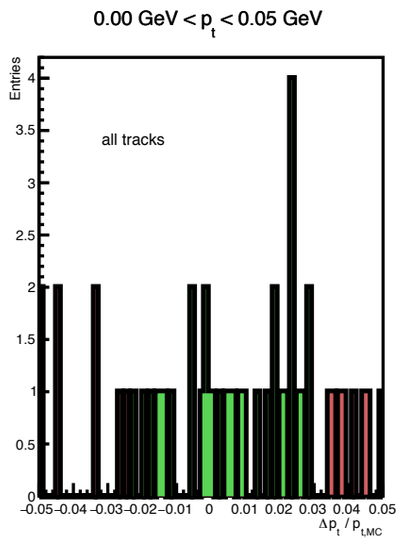
Relative p_t residuals VS $p_{t,MC}$

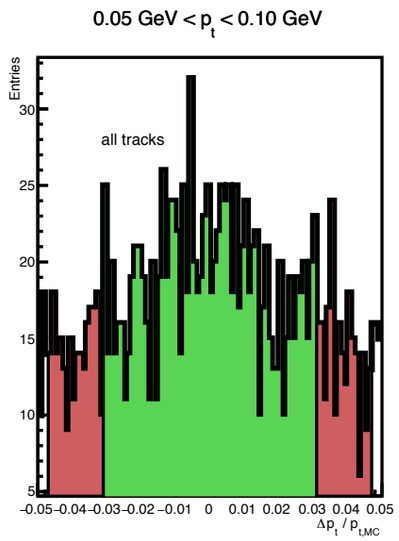


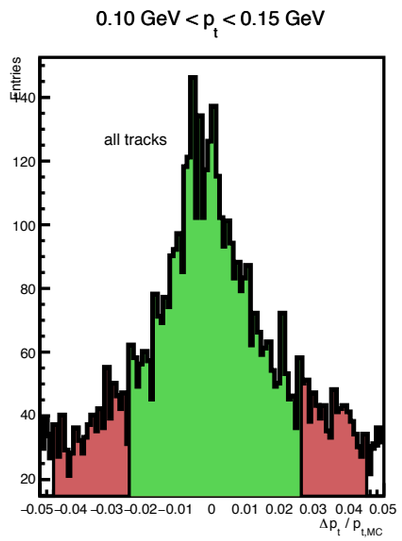
- 2D plot: ($p_{t,reco}$ - $p_{t,MC}$) / $p_{t,MC}$ VS $p_{t,MC}$
- 10 bins of $p_{t,MC}$ (irregular binning), projection Y, quantiles
- 2 types: all tracks/ pValue < 0.05

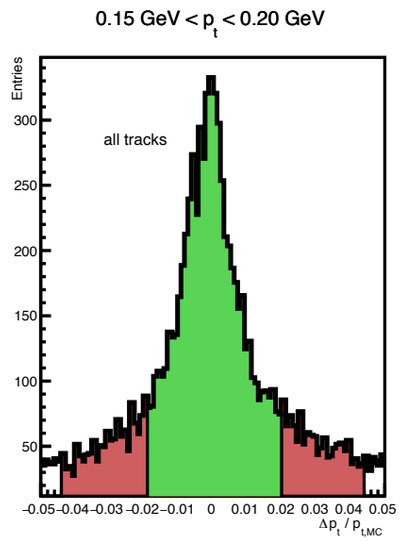
Y projections

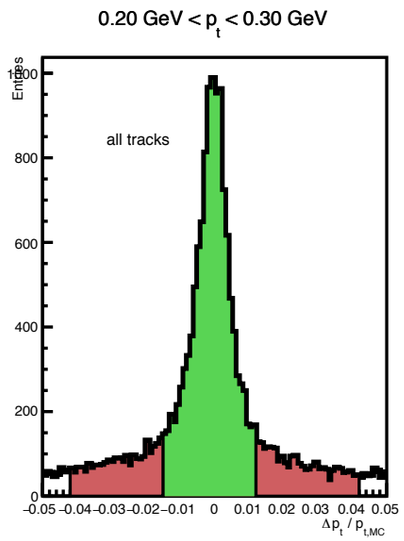
all tracks

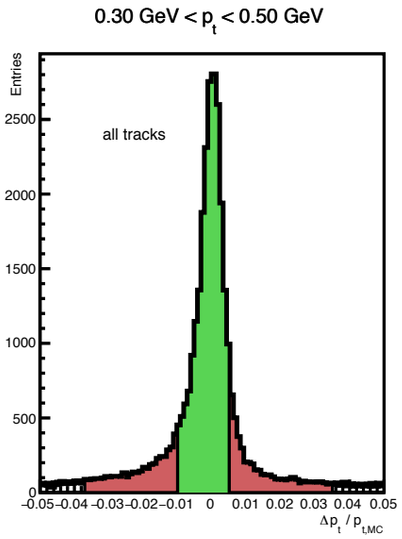


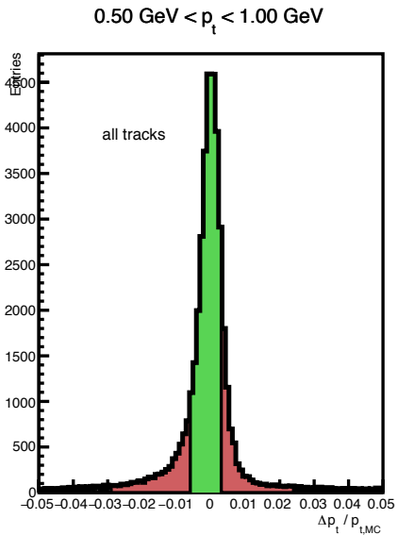


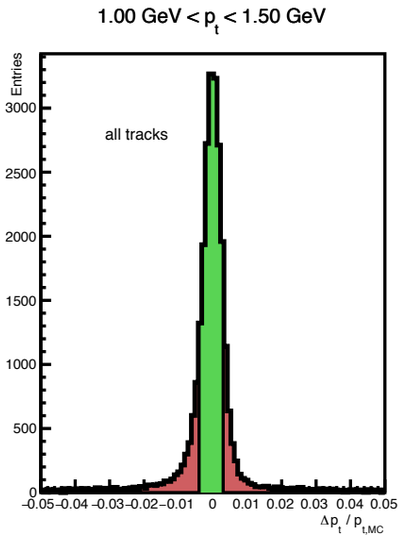


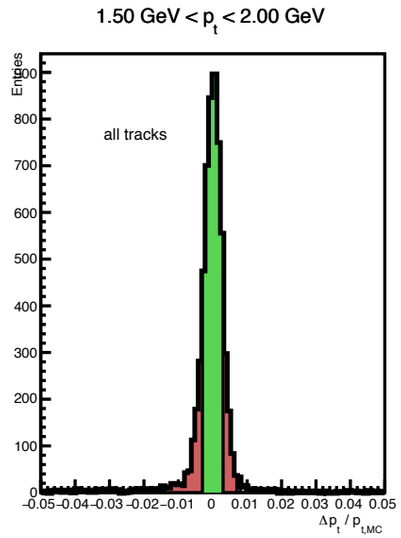


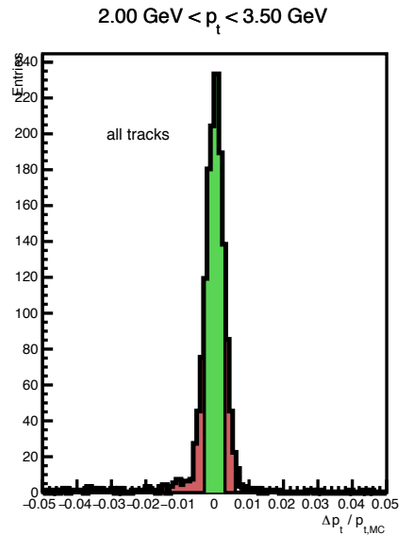




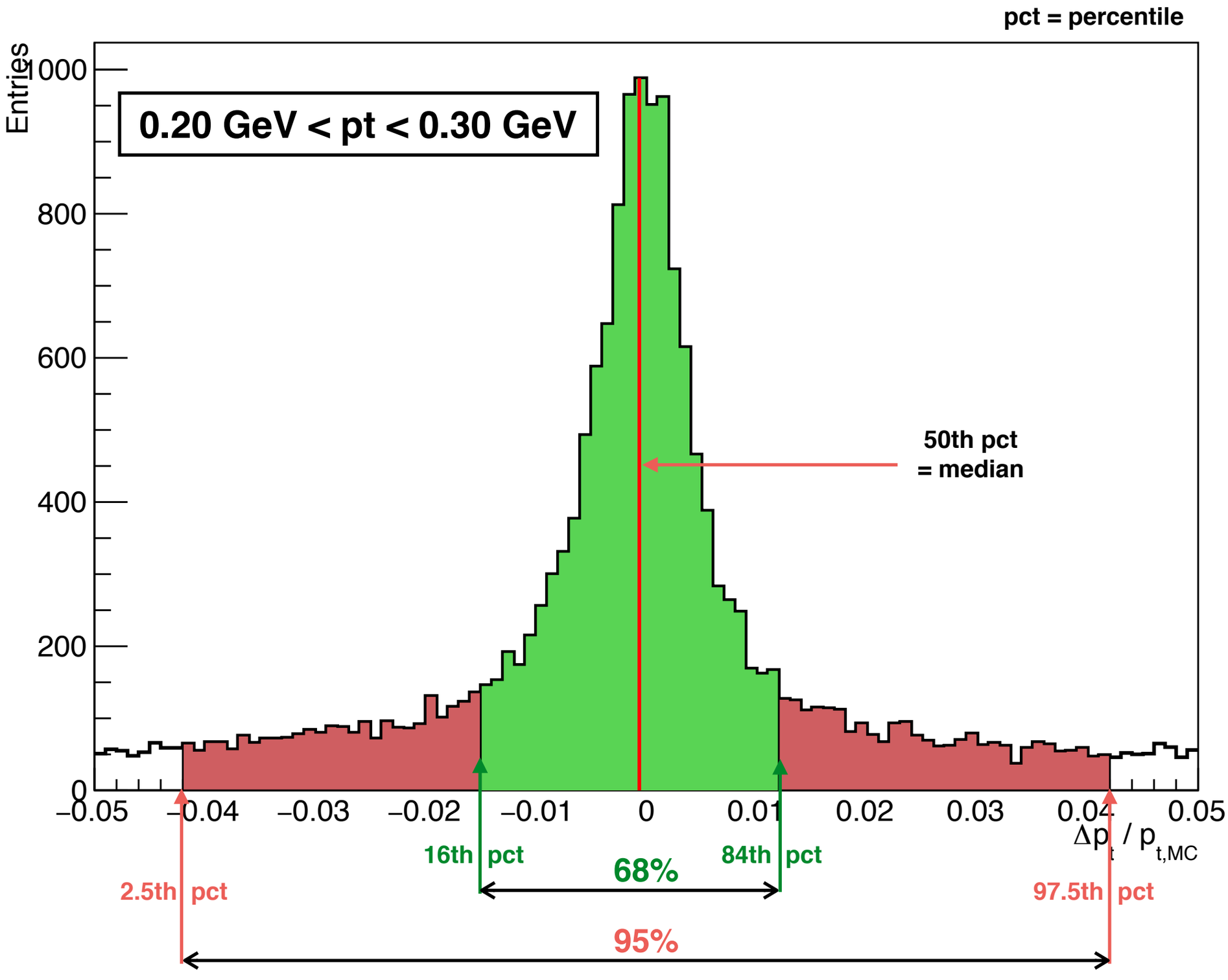








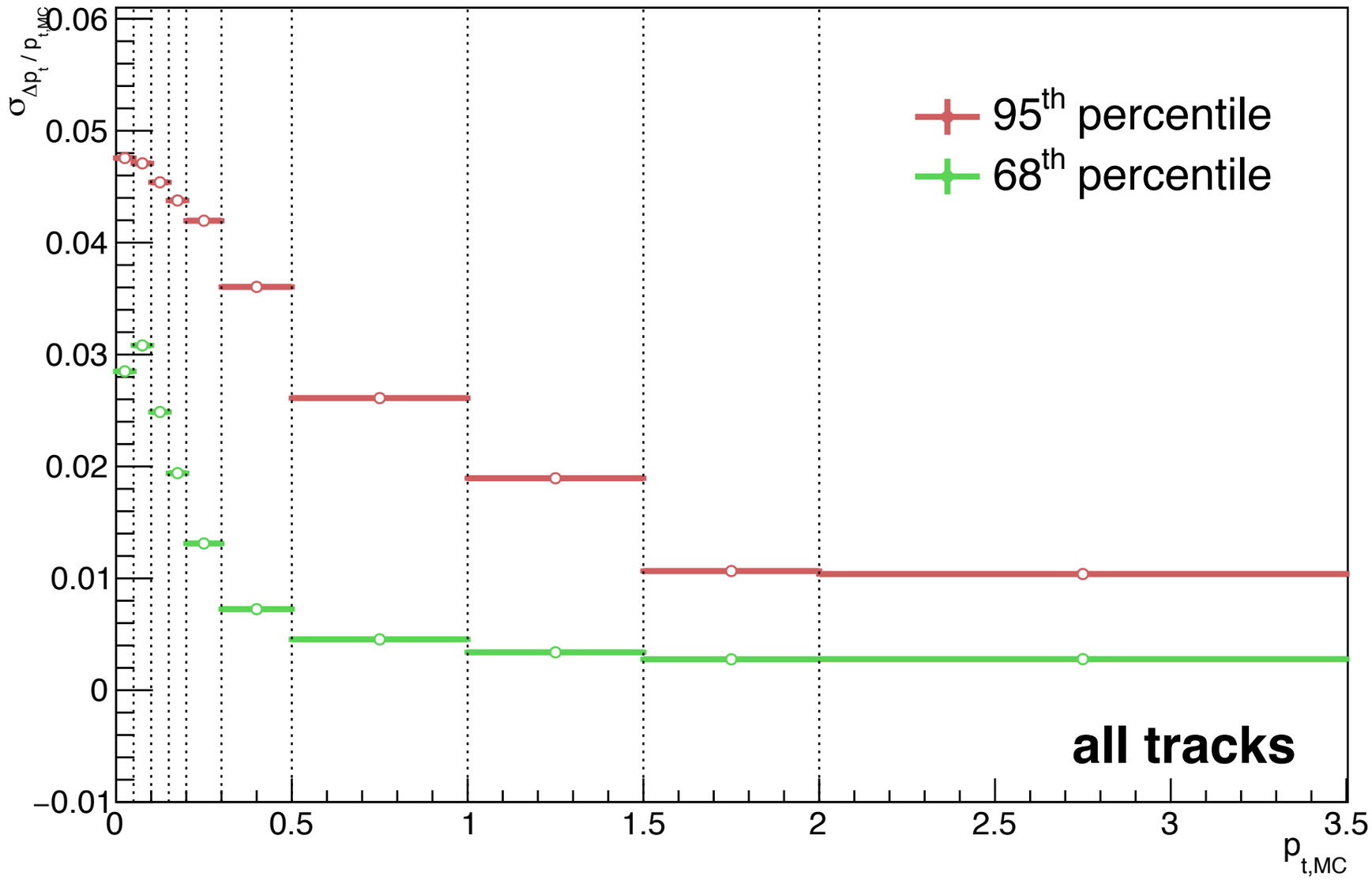
Single p_t bin



p_t resolution

- p_t resolution estimator: $(x_{84pct} - x_{16pct}) / 2$ (68%, 1σ gaus)

  $(x_{2.5pct} - x_{97.5pct}) / 2$ (95%, 2σ gaus)



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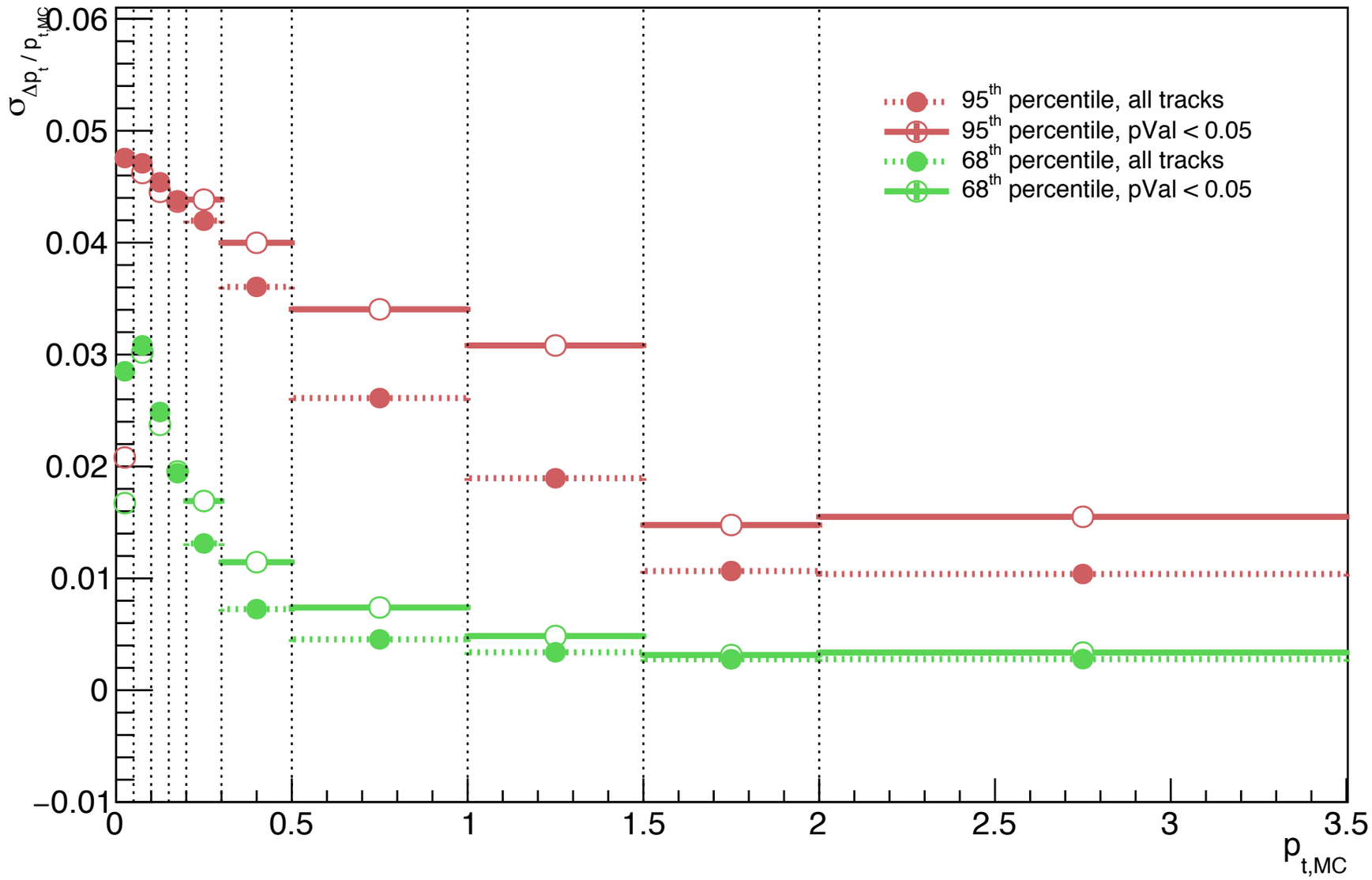
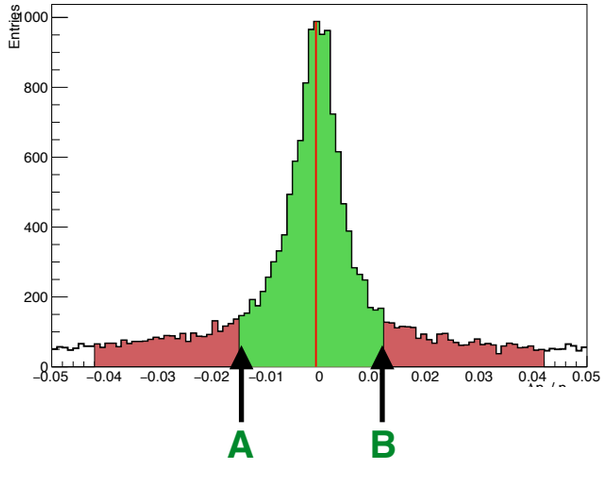


Error estimation on y axis

- $x_{ql} = [0.16, 0.84]$ $y_{ql} = [A, B]$



- define a critical value depending on the CL and on the number of entries of the histogram (using Kolmogorov probability)

- Subtract and add the CL to x_{ql}, and obtain new y_{ql}

  $x_{ql}^{-} = [0.16\text{-CL}, 0.84\text{-CL}]$ $x_{ql}^{-} = [0.16+CL, 0.84+CL]$

  $y_{ql}^{-} = [A - \Delta A^{-}, B - \Delta B^{-}]$ $y_{ql}^{-} = [A + \Delta A^{+}, B - \Delta B^{+}]$

- obtain the error on the n^{th} quantile (n = 16,84) with the formula:

  $$error\_n = (\Delta^{+}n + \Delta^{-}n) / 2$$

  where

  $\Delta^{+}n = x_{ql+,n} - x_{ql,n}$ and $\Delta^{-}n = x_{ql,n} - x_{ql-,n}$

- final error: $sqrt(error\_16^2 + error\_84^2) / 2$

p_t resolution