

$\pi^- + \text{C}$ analysis

- secondary pion beam (from N + Be reaction) at 685 MeV/C
- proton, deuteron, π^- , π^+ production analysis from INCL
- mass cuts
(to be improved for pip: ~20% error compared with GeantPID)
- comparison of HADES experimental data with INCL
(already done in acceptance, comparison in 4pi in progress)

acceptance = full analysis chain:
INCL \rightarrow HGEANT \rightarrow DST(HYDRA)

experimental data vs INCL

acceptance = full analysis chain:
INCL → HGEANT → DST(HYDRA)

- experimental data compared to INCL simulation in HADES acceptance
- both are normalized in two ways:
 - A (absolute normalization) **counts -> mb / unit**
 - INCL: ->Scale($1.462 \cdot 10^{-5}$)
total cross-section [mb] / # of simulated events (1462.32mb / 100 000 000)
 - data: ->Scale($10.165 \cdot 10^{-7}$)
derived from elastic pim-p and rescaled to pim+12C (Fatima presentation)
 - B (shape comparison)
 - ->Scale(1/Integral())

III. NORMALISATION

counts -> mb/unit

Data :
$$F_{Norm} = 2 \times \frac{\sigma_{el}}{N_{el}} \times F_{C/CH2}.$$

- Normalisation for pi-+p cross section CH2 target (all statistics): $\frac{\sigma_{el}}{N_{el}} \cdot 1.107 \times 10^{-7}$
 - σ_{el} - known cross-section of elastic scattering in full solid angle.
 - N_{el} - number of elastic scattering events in full solid angle
 - N_R - number of collisions of the reaction of interest.
- relative normalisation C (all stat.)/CH2 (all stat.) = $F_{C/CH2} = 1./0.2178$.

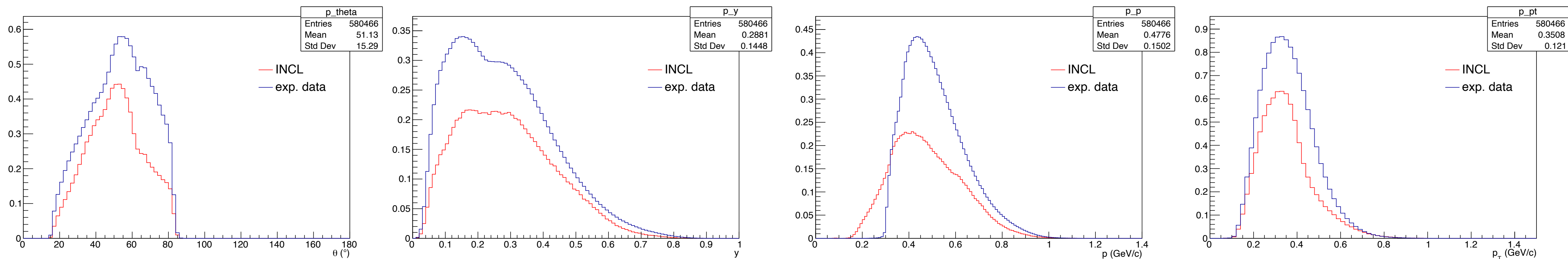
INCL :
$$F_{Norm} = \frac{\sigma_{reaction}}{\text{Number of shots}}$$

- $\sigma_{reaction} = 1462.32$ mb.
- Number of shots = 100 000 000.

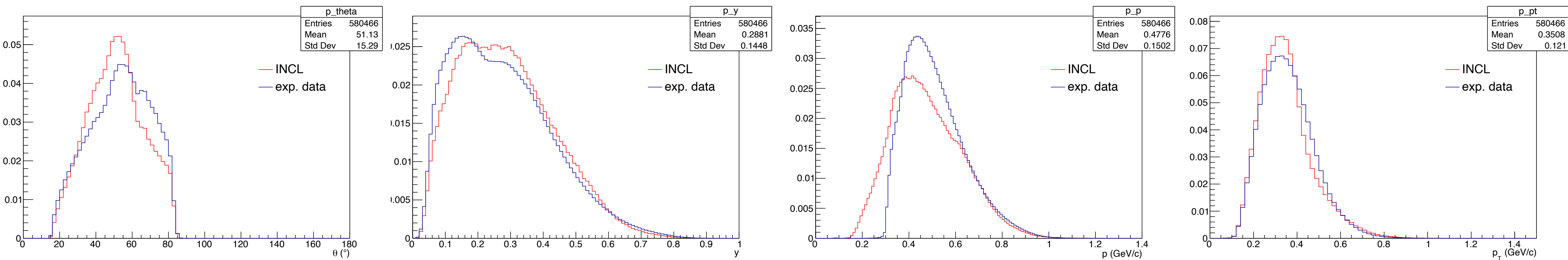
experimental data vs INCL: p

— INCL
— exp. data

A



B



θ

y

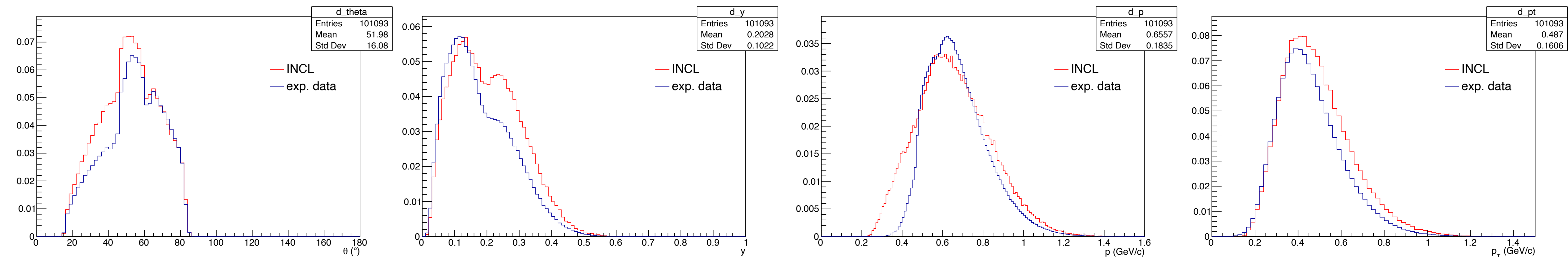
p

p_T

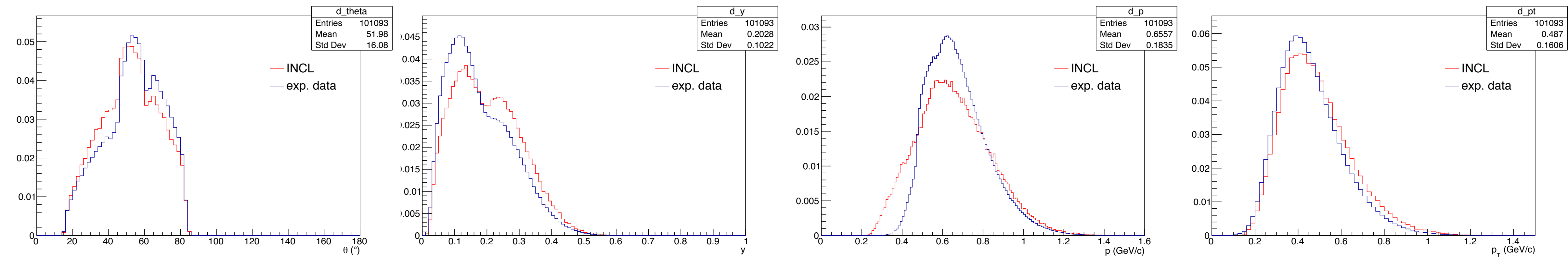
experimental data vs INCL: d

— INCL
— exp. data

A



B



θ

y

p

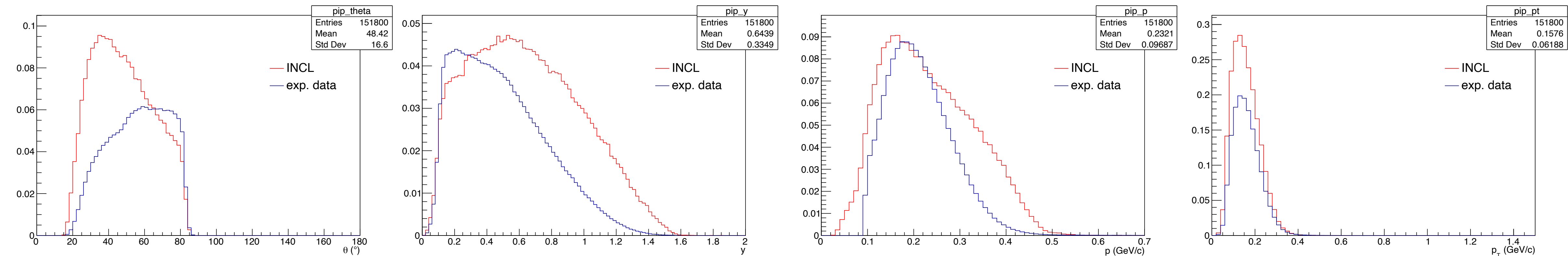
p_T

experimental data vs INCL: π^+

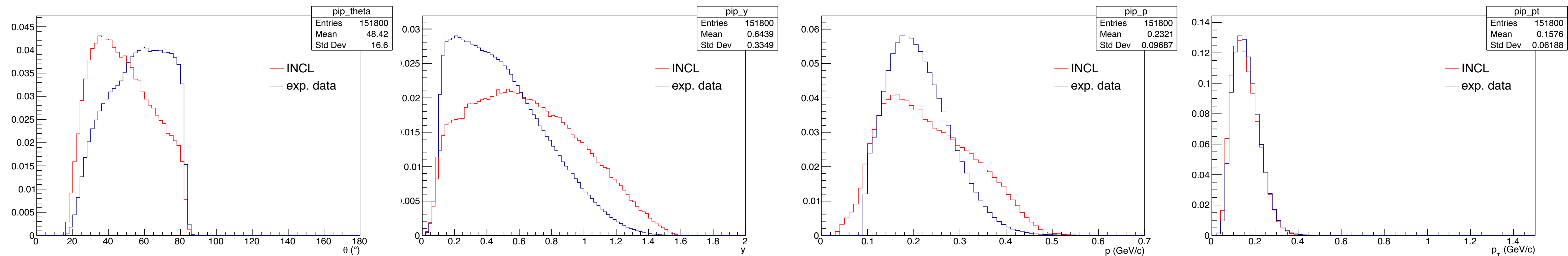
pip cuts still need to be improved

— INCL
— exp. data

A



B



θ

y

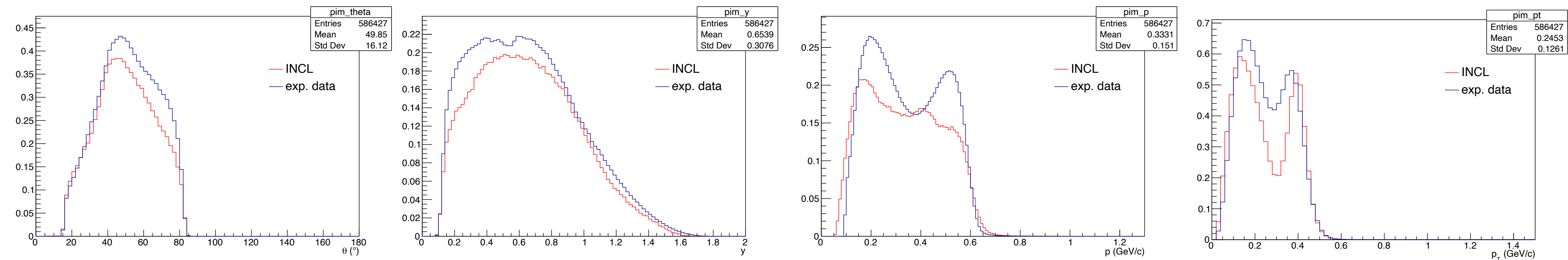
p

p_T

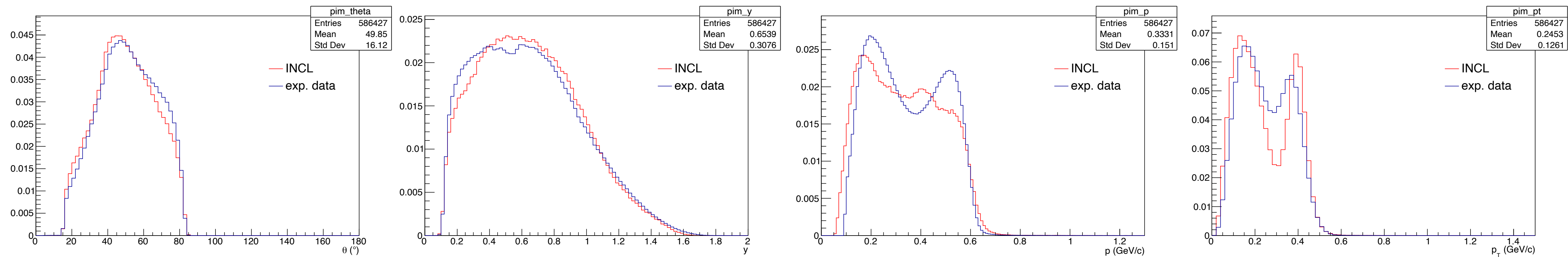
experimental data vs INCL: π^-

— INCL
— exp. data

A



B



θ

y

p

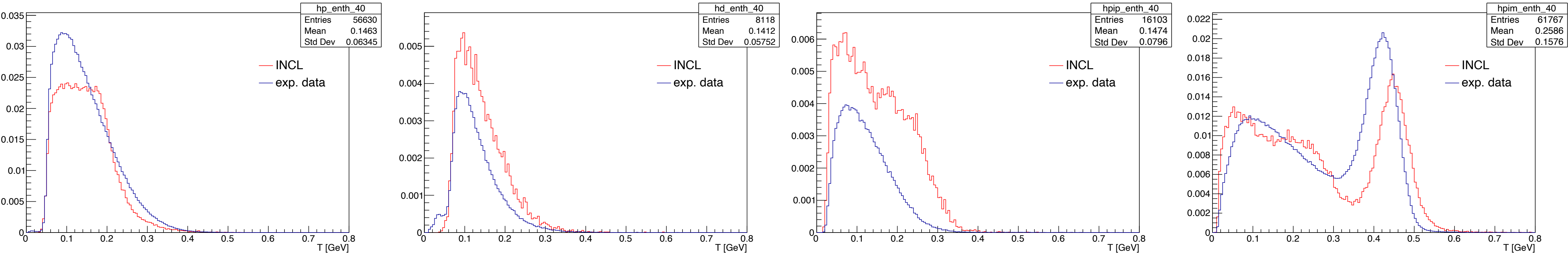
p_T

experimental data vs INCL: T- θ (differential)

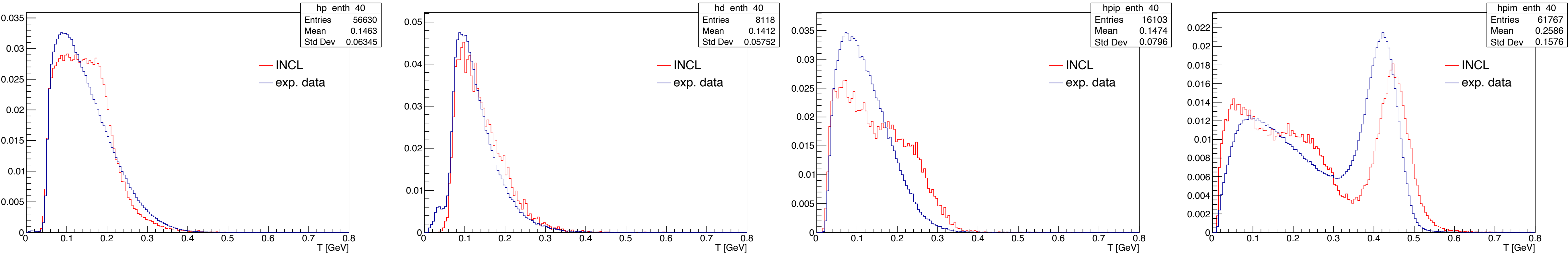
$\theta = 40^\circ$ $\Delta\theta = 5^\circ$

— INCL
— exp. data

A



B



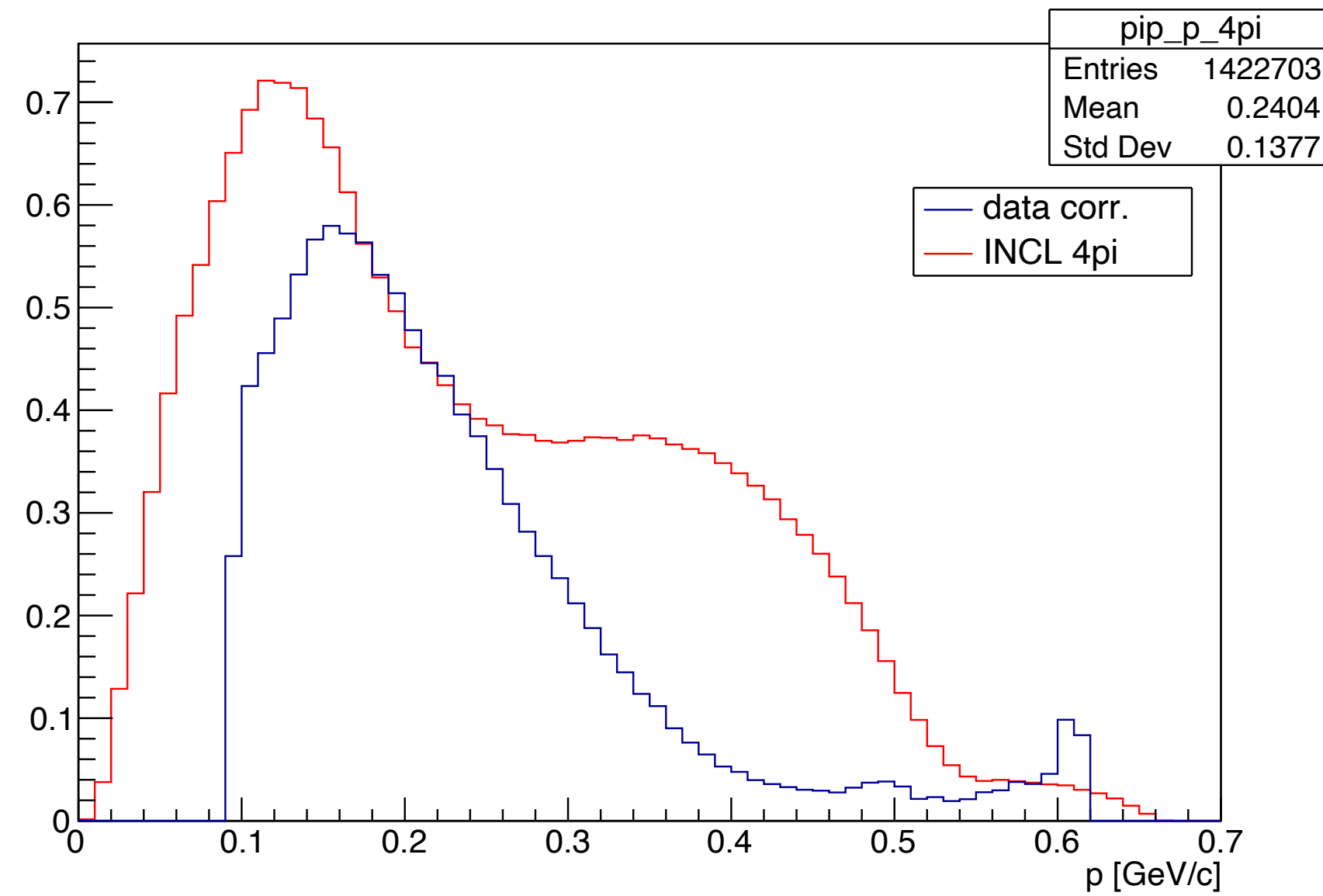
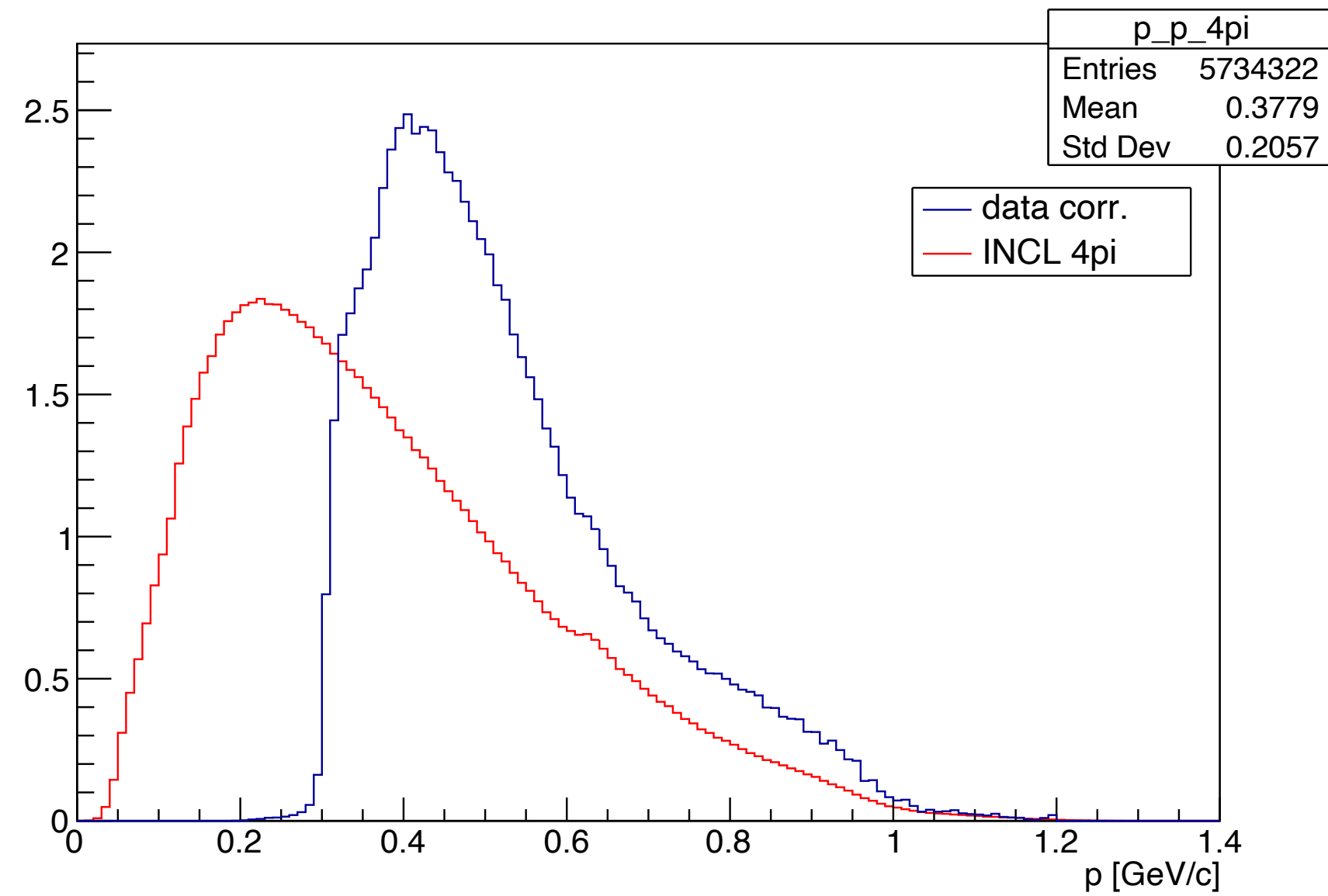
p

d

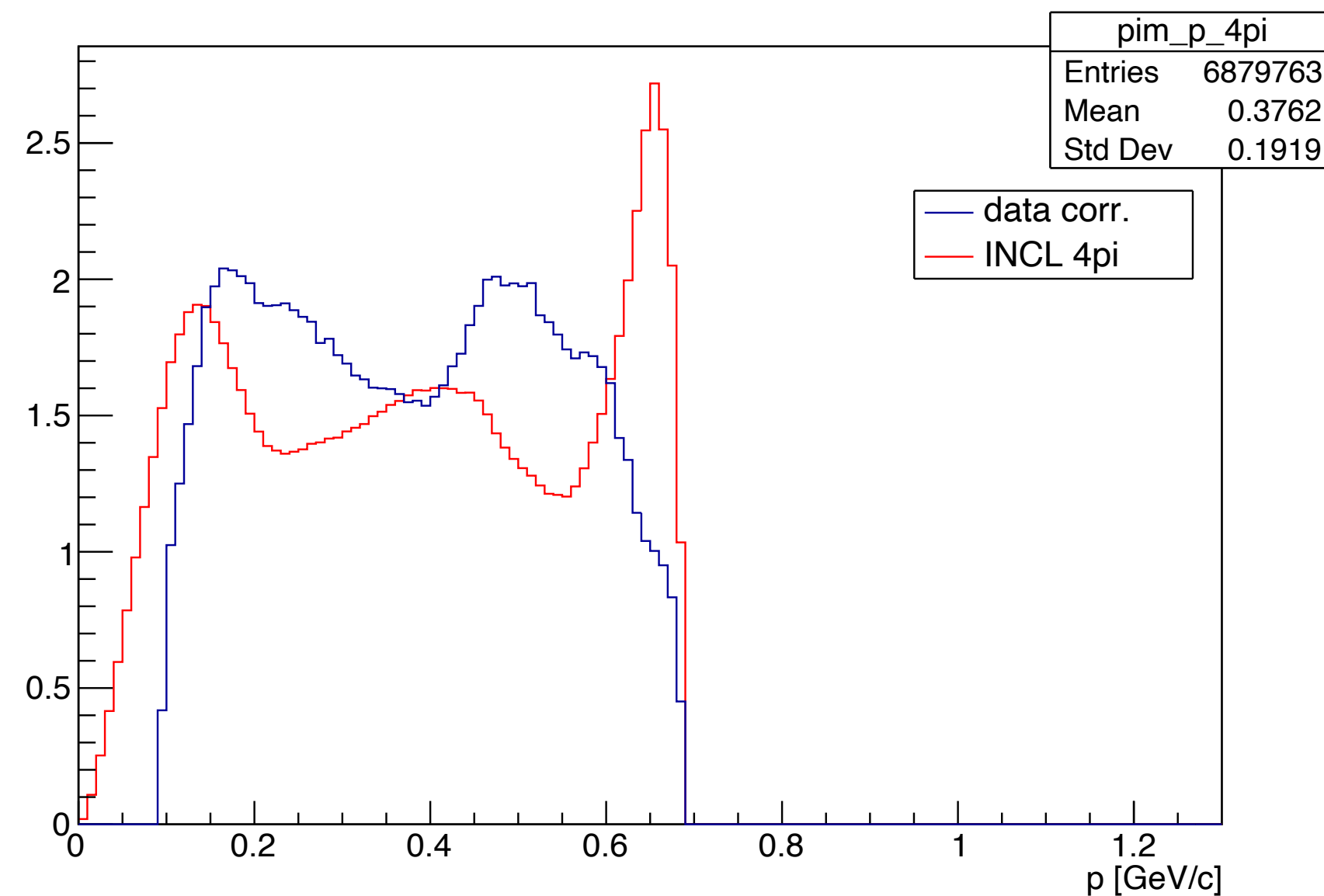
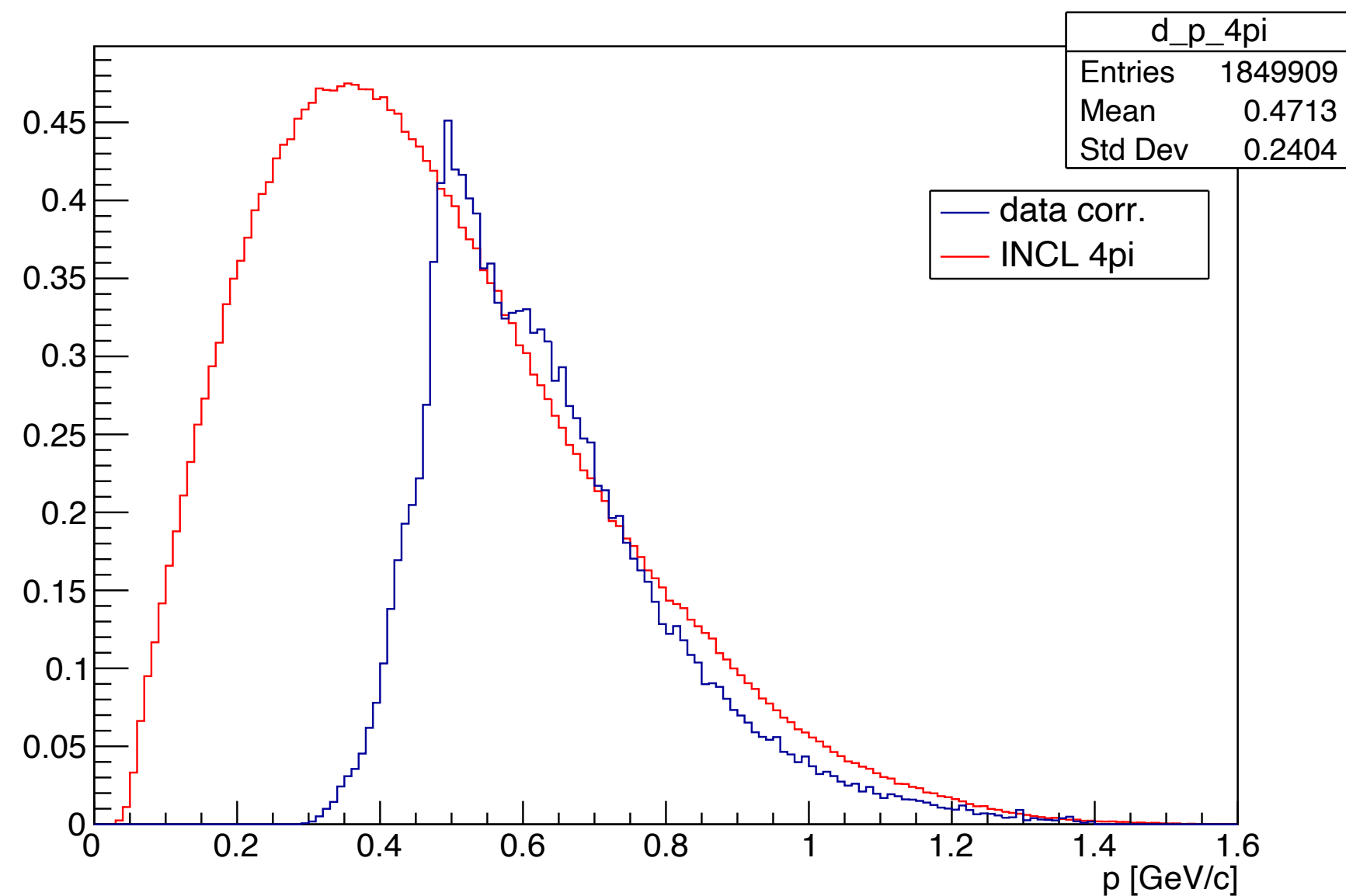
π^+

π^-

experimental data vs INCL (4pi)



- data and INCL scaled accordingly
- experimental data corrected for acceptance and efficiency effects (1D)



maybe 2D/3D correction would be better?