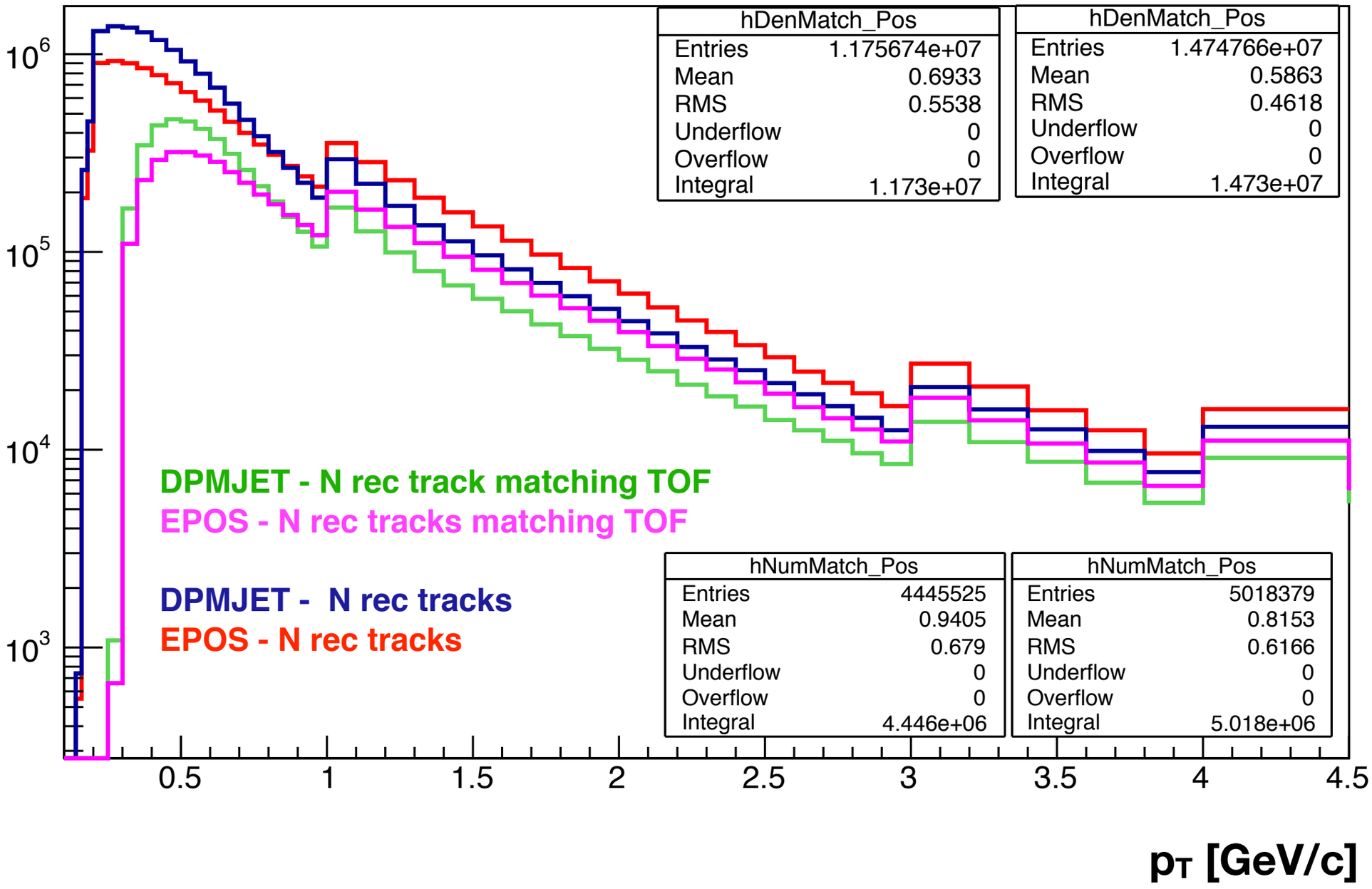
Positive over negative ratio at pPb 8.16 TeV

Number of reconstructed (inclusive) tracks in MC



Total (full pT) EPOS:

- Pos: 11.76 Mevt
- Neg: 11.62 Mevt

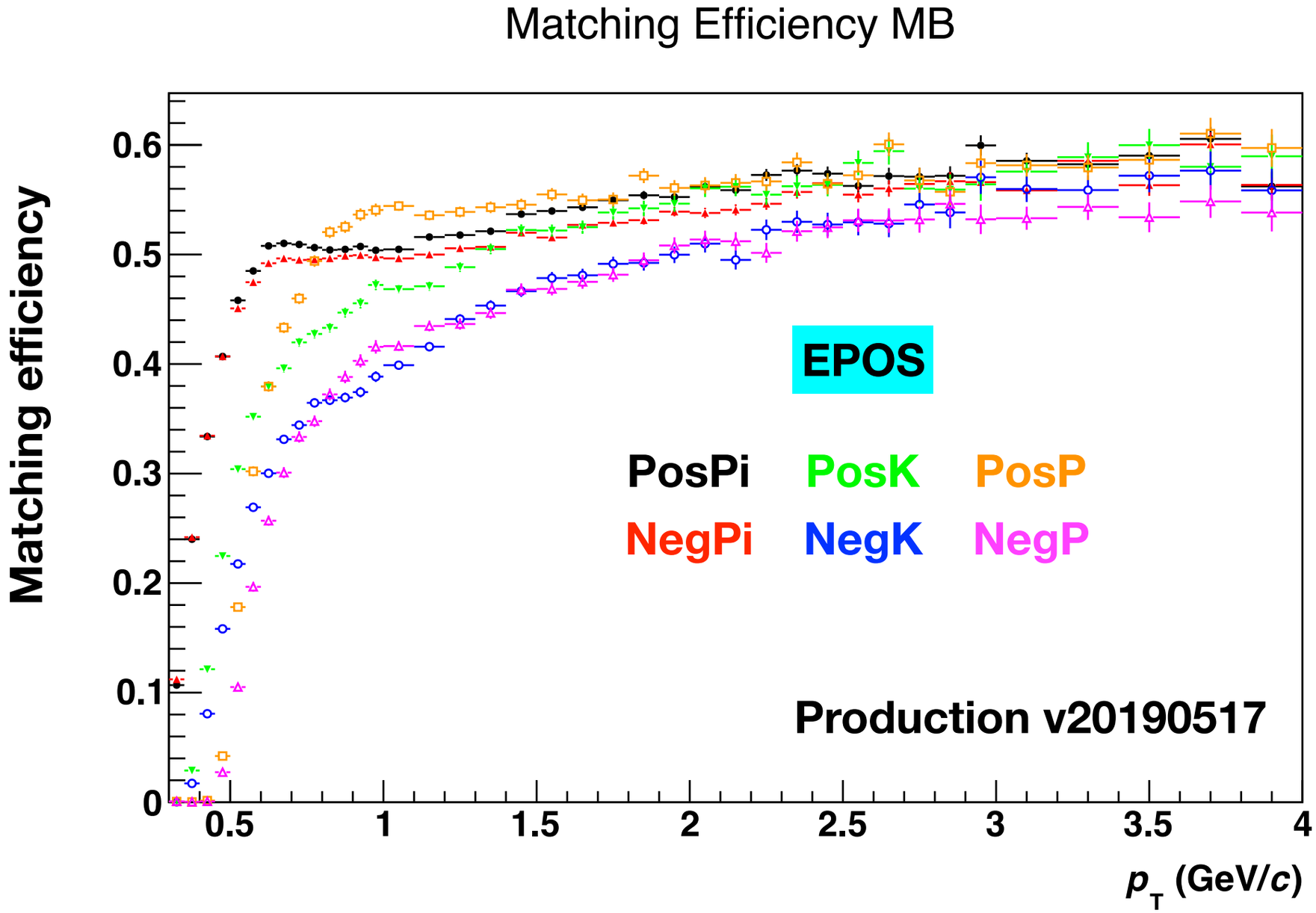
Total (full pT) DPMJET:

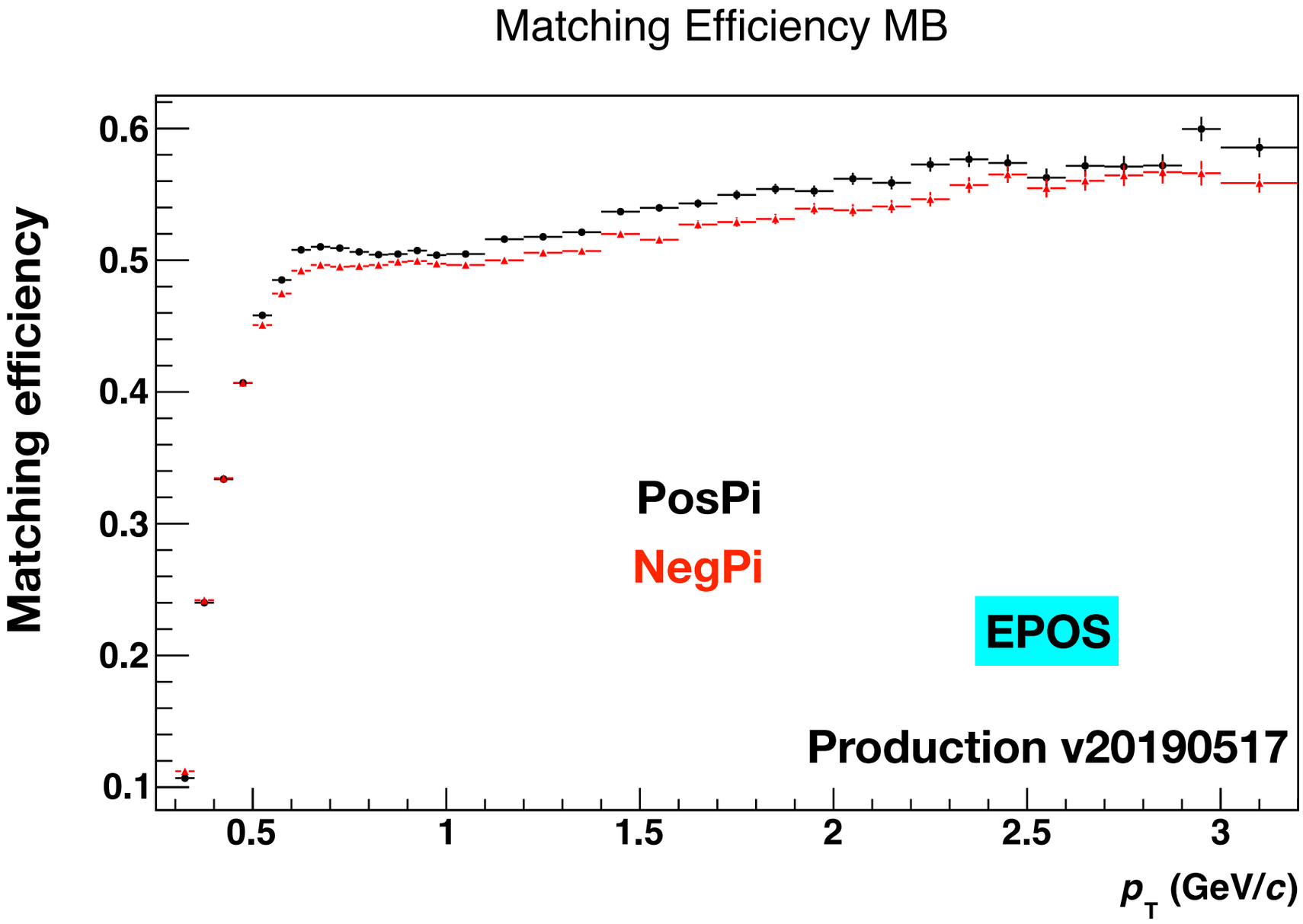
- Pos: 14.73 Mevt
- Neg: 14.58 Mevt

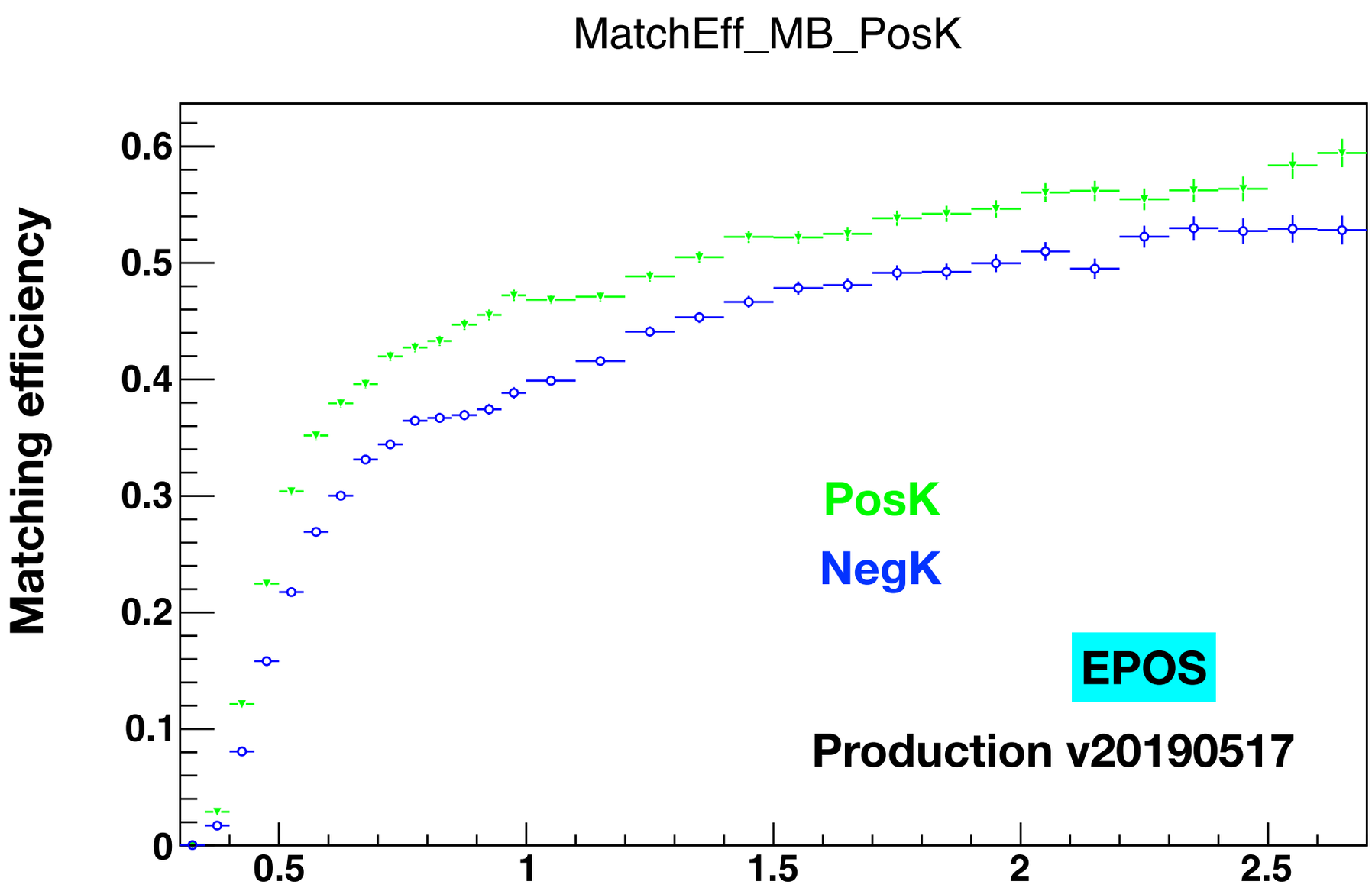
Up to 1 GeV/c DPMJET (13.6 Mevt) > EPOS (9.57 Mevt)

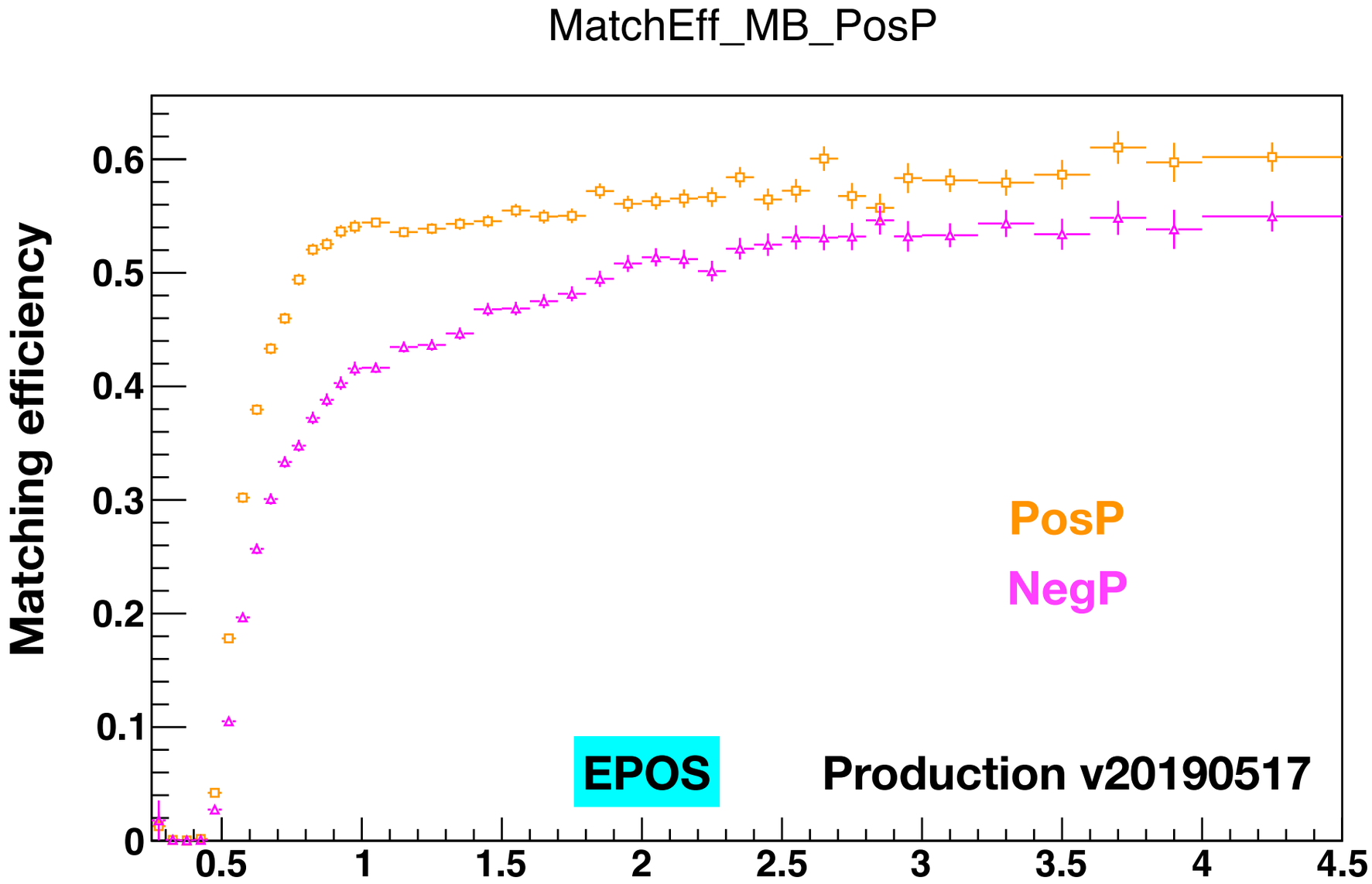
For [1,4] GeV/c DPMJET (1.8 Mevt) < EPOS (2.38 Mevt)

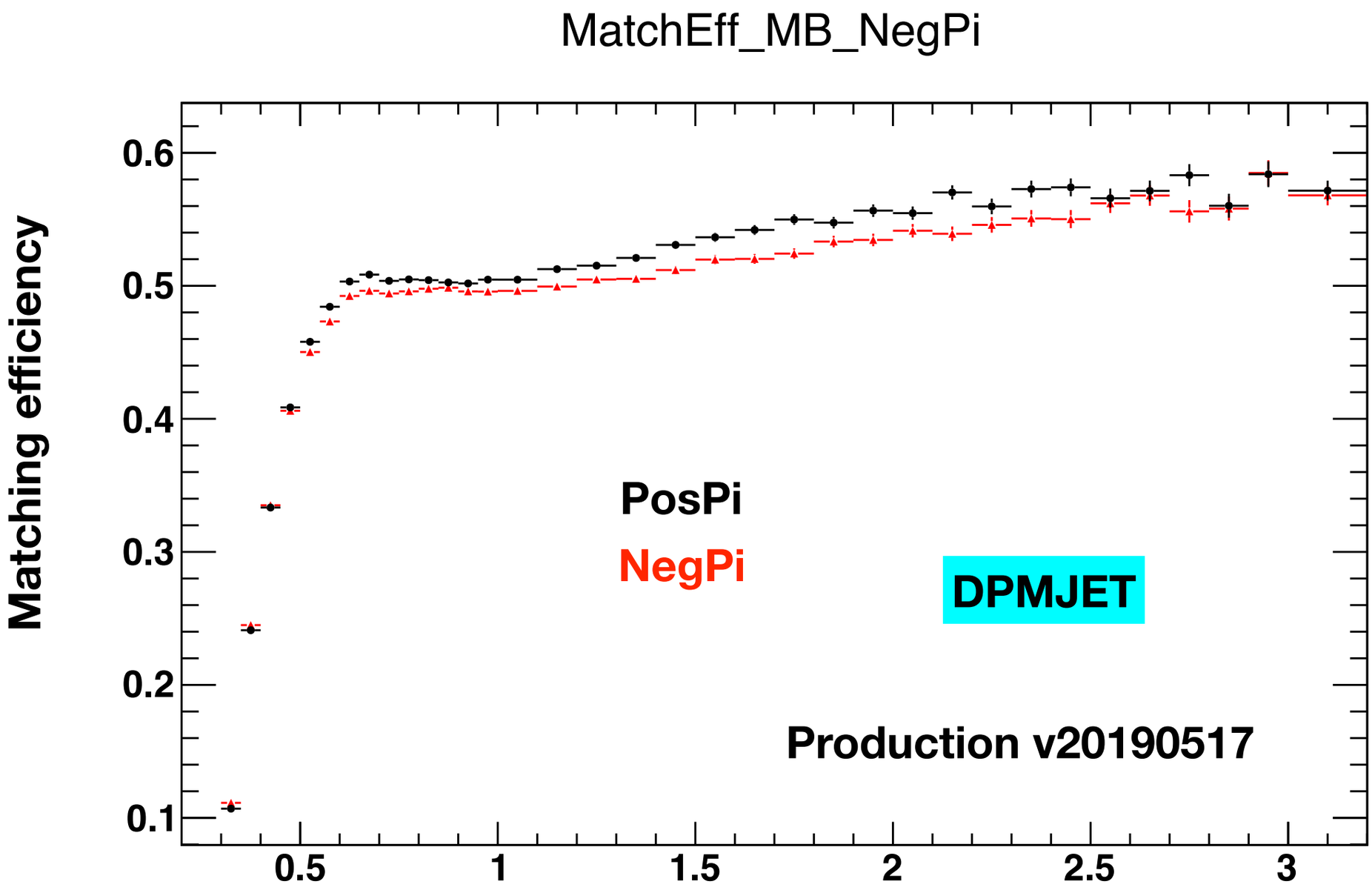
For TOF in [1,4] GeV/c DPMJET (1.09 Mevt) < EPOS (1.43 Mevt)


Matching Efficiency MB
Matching efficiency
0.6
0.5
0.4
0.3
0.2
0.1
0
0.5
1
1.5
2
2.5
3
3.5
4
p_T (GeV/c)
EPOS
PosPi
PosK
PosP
NegPi
NegK
NegP
Production v20190517

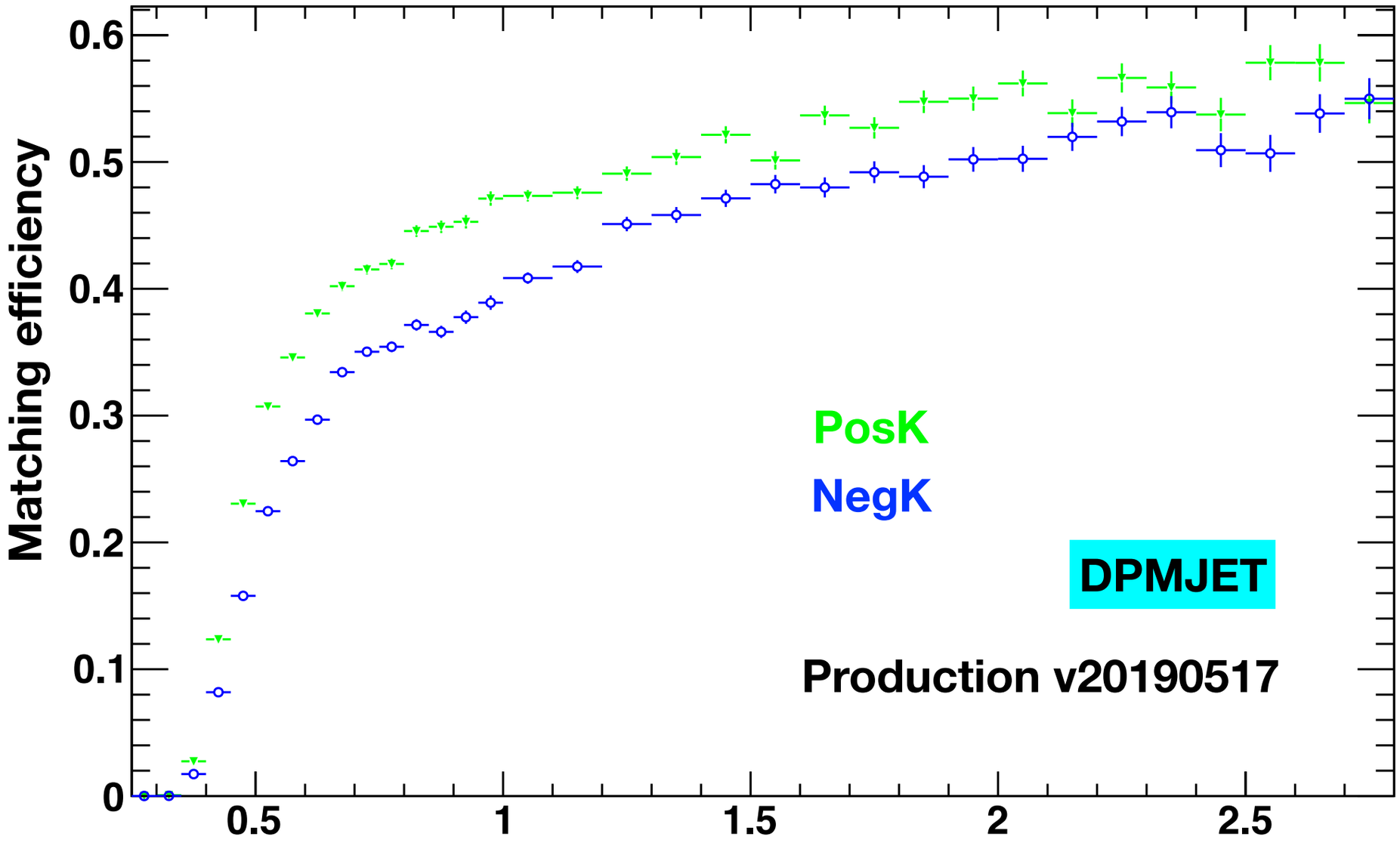

Matching Efficiency MB
Matching efficiency
0.6
0.5
0.4
0.3
0.2
0.1
0.5
1
1.5
2
2.5
3
p_T (GeV/c)
PosPi
NegPi
EPOS
Production v20190517


MatchEff_MB_PosK
Matching efficiency
0.6
0.5
0.4
0.3
0.2
0.1
0
0.5
1
1.5
2
2.5
PosK
NegK
EPOS
Production v20190517


MatchEff_MB_PosP
Matching efficiency
0.6
0.5
0.4
0.3
0.2
0.1
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
PosP
NegP
EPOS
Production v20190517


MatchEff_MB_NegPi
Matching efficiency
PosPi
NegPi
DPMJET
Production v20190517
0.6
0.5
0.4
0.3
0.2
0.1
0.5
1
1.5
2
2.5
3

MatchEff_MB_PosK



MatchEff_MB_PosP

Matching efficiency

0.6
0.5
0.4
0.3
0.2
0.1
0

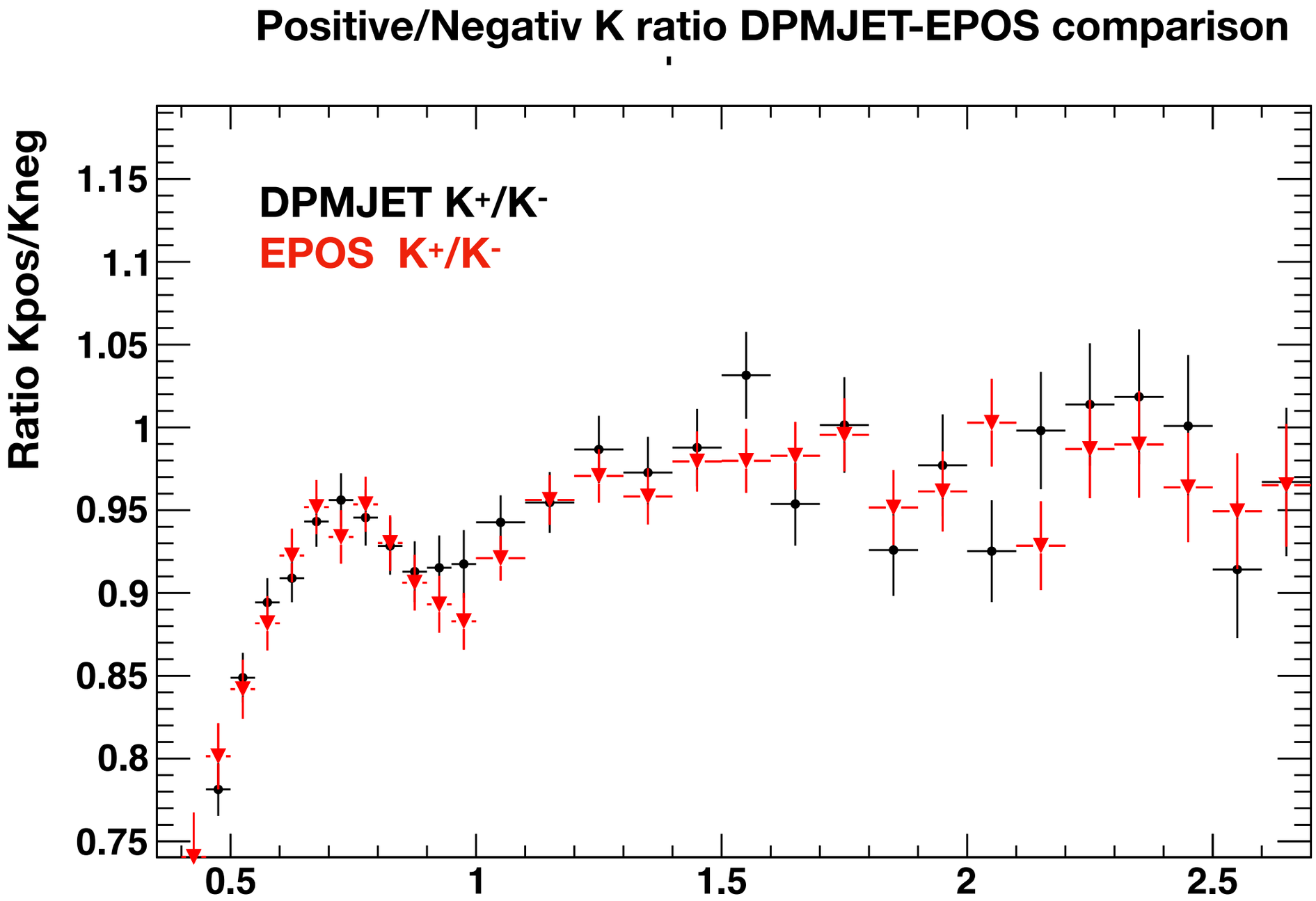
0.5 1 1.5 2 2.5 3 3.5 4 4.5

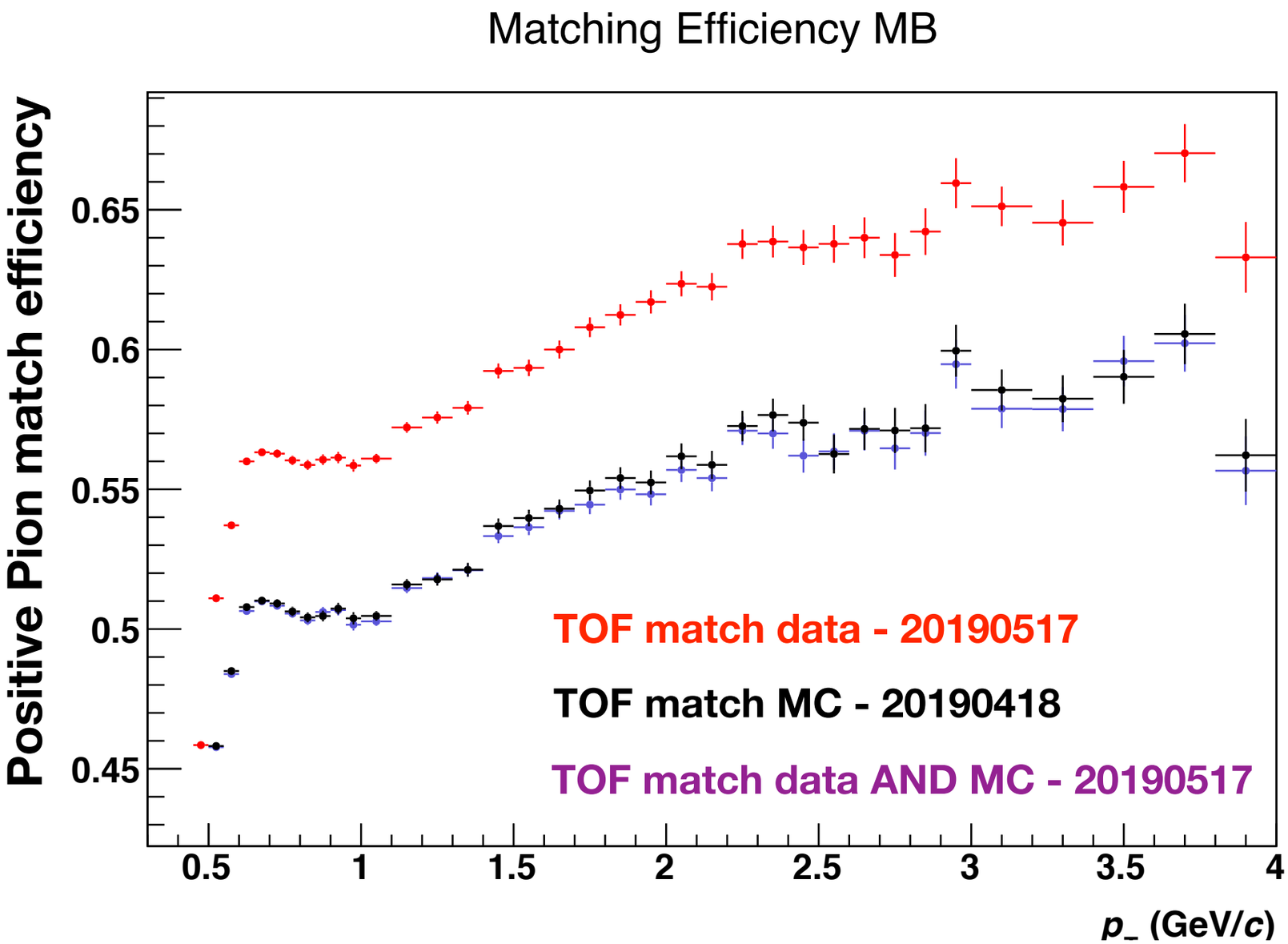
PosP

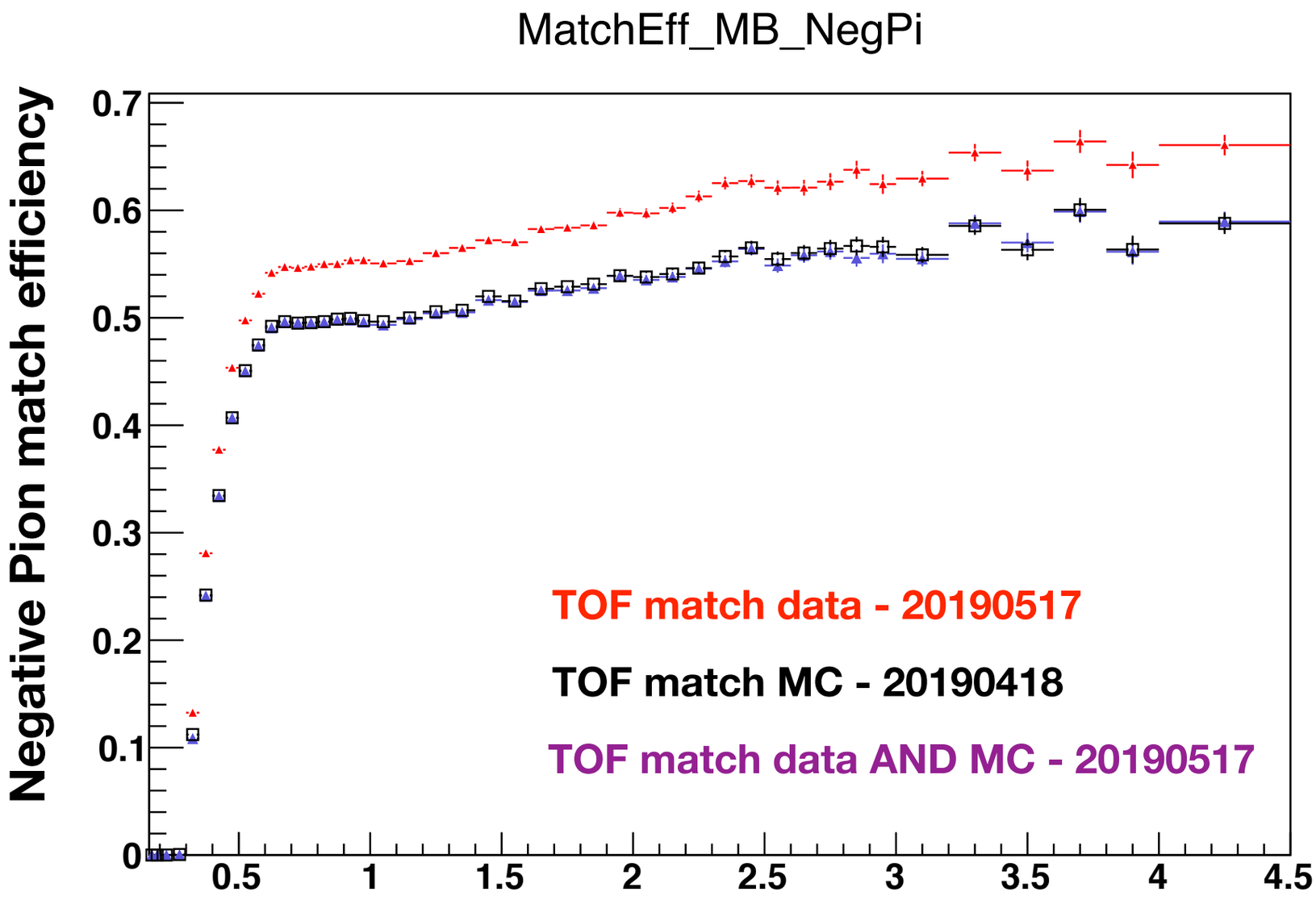
NegP

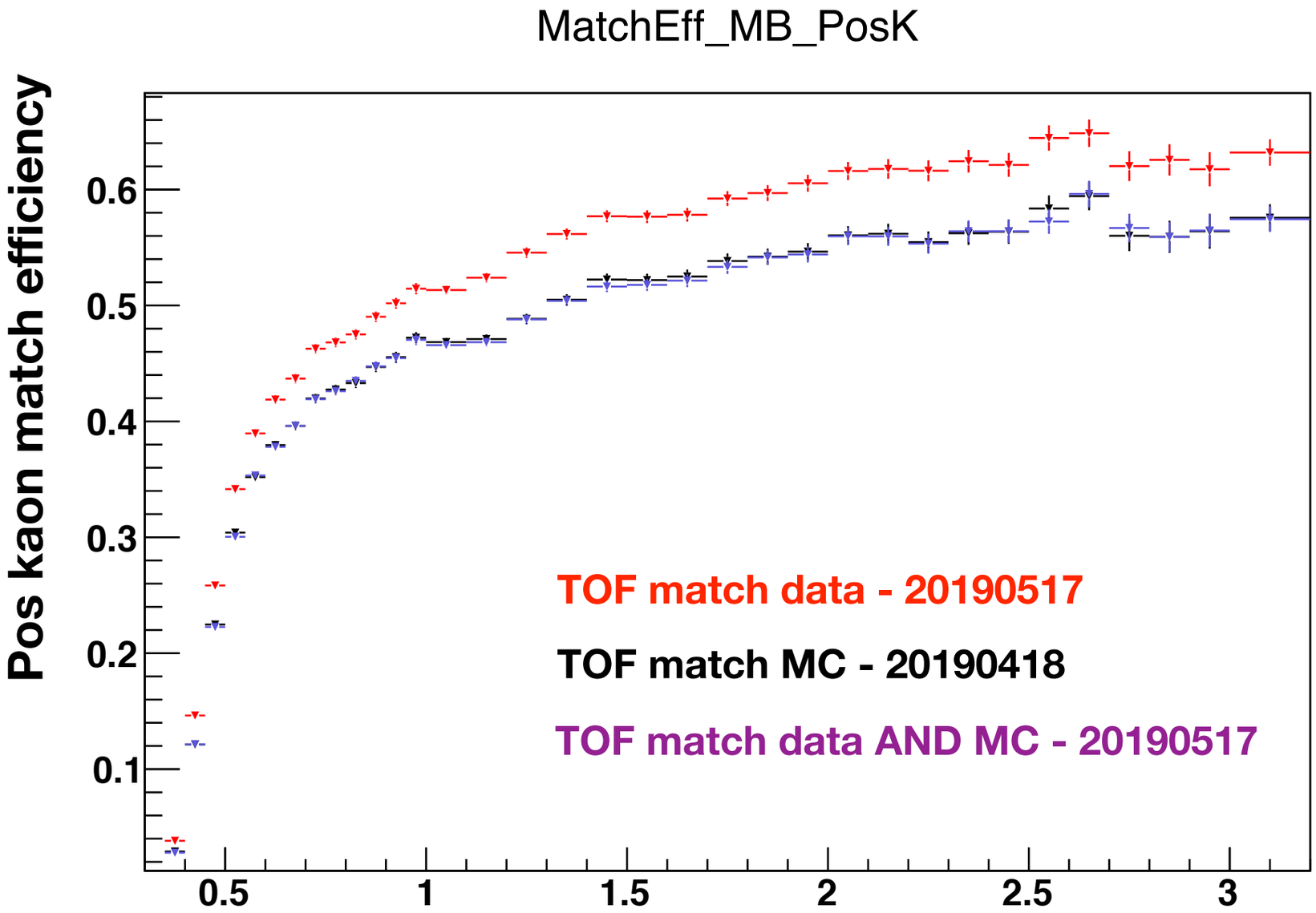
DPMJET

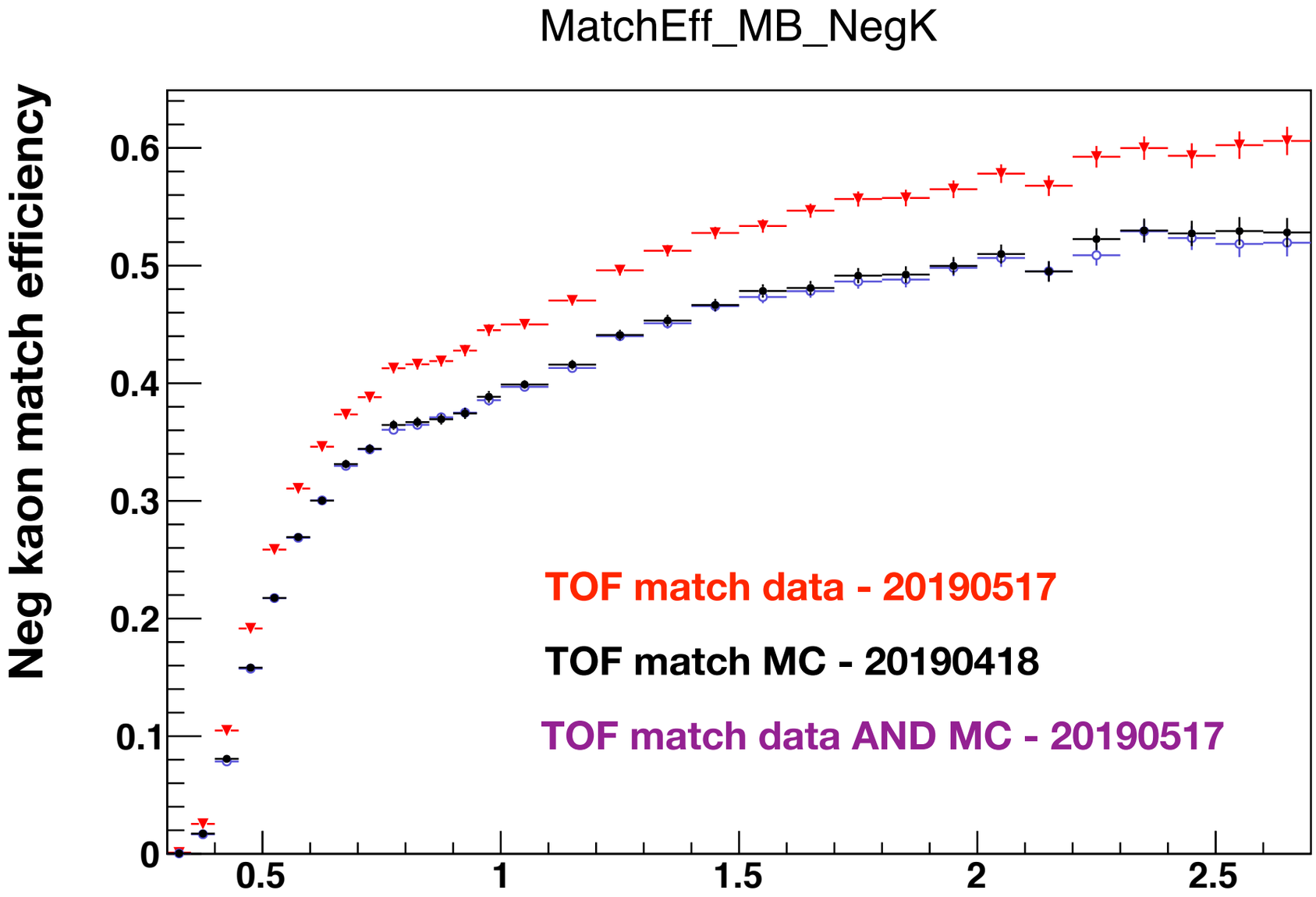
Production v20190517

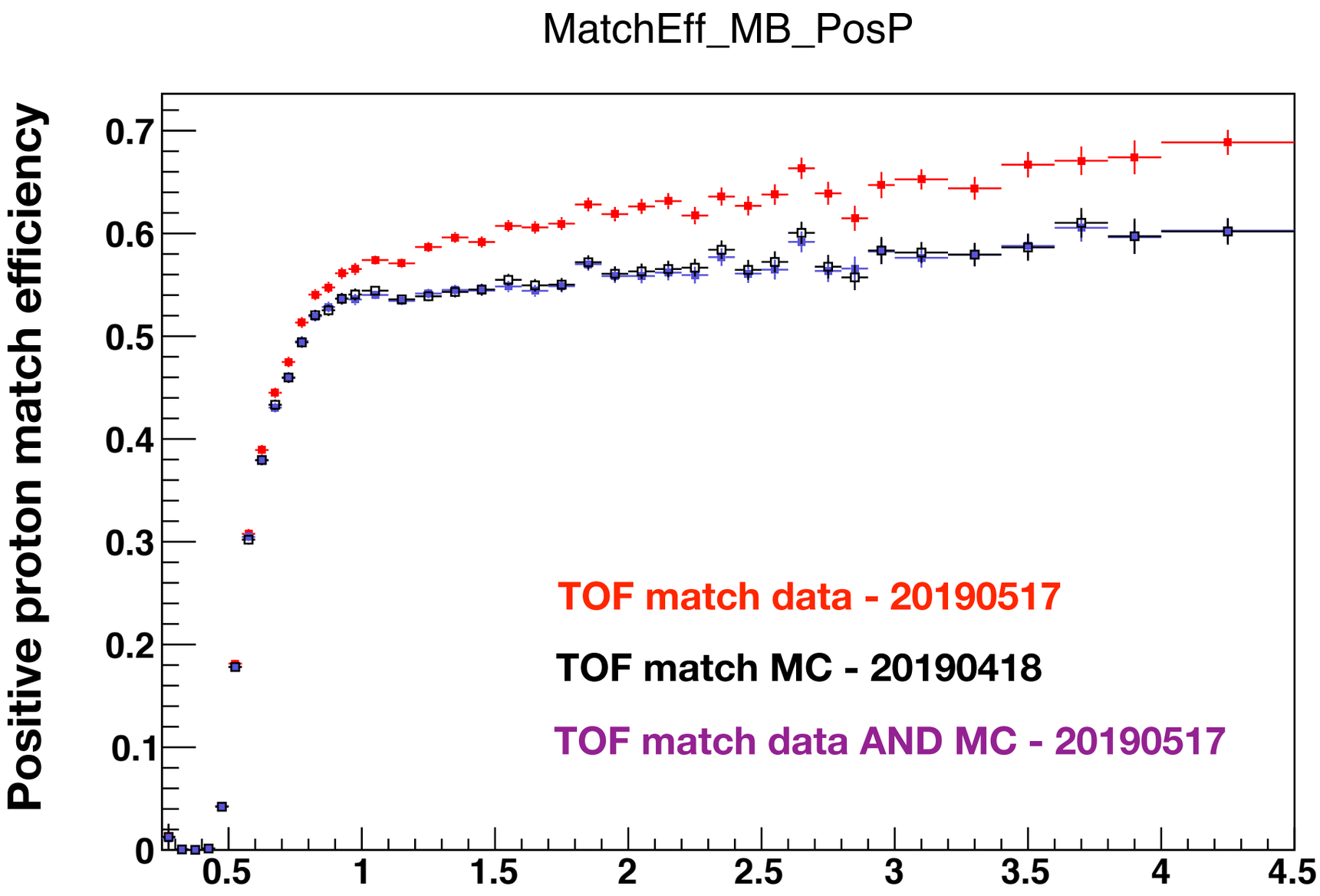

Positive/Negativ K ratio DPMJET-EPOS comparison
DPMJET K+/K-
EPOS K+/K-
Ratio Kpos/Kneg
1.15
1.1
1.05
1
0.95
0.9
0.85
0.8
0.75
0.5
1
1.5
2
2.5

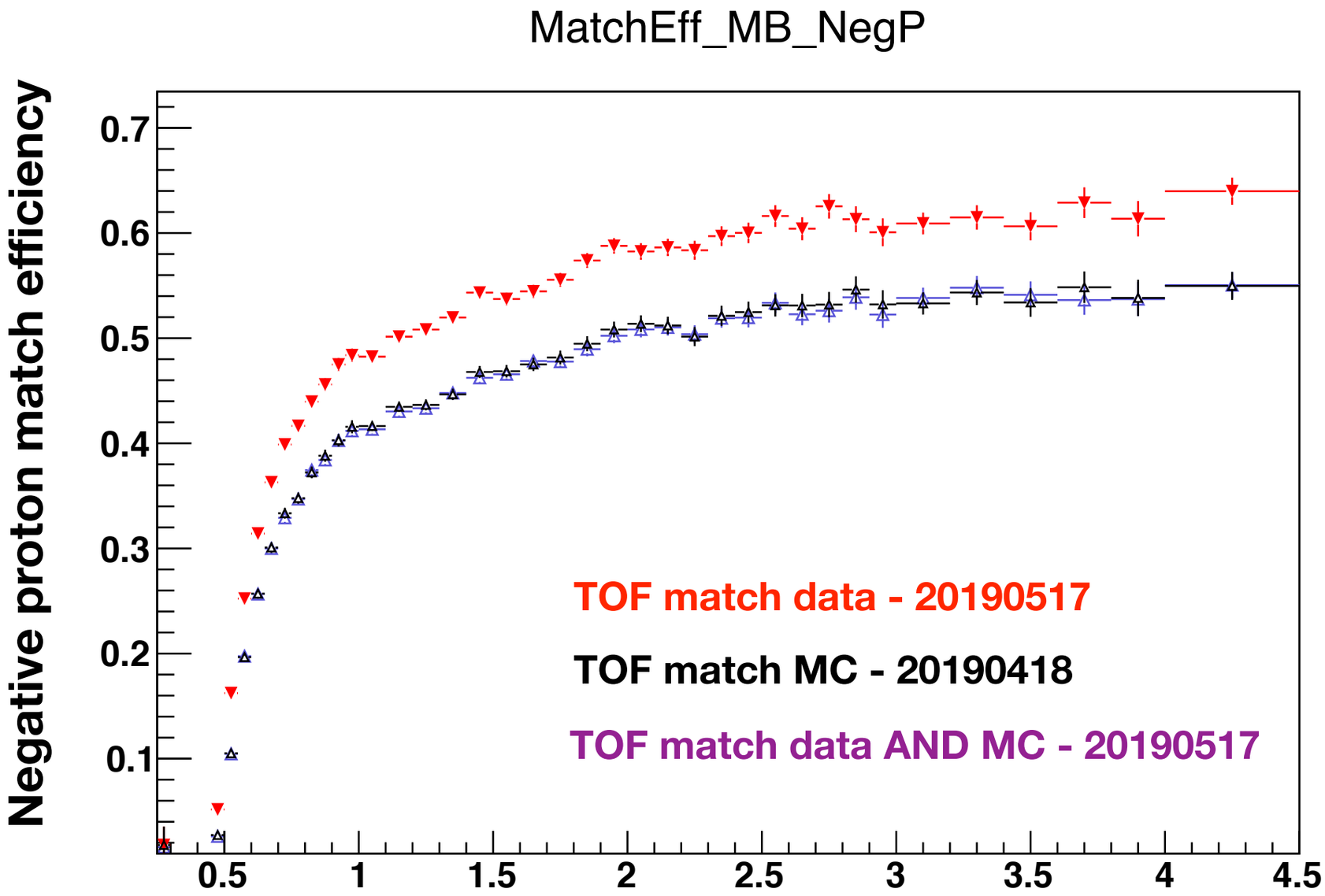

Matching Efficiency MB
Positive Pion match efficiency
0.65
0.6
0.55
0.5
0.45
0.5
1
1.5
2
2.5
3
3.5
4
p_ (GeV/c)
TOF match data - 20190517
TOF match MC - 20190418
TOF match data AND MC - 20190517


MatchEff_MB_NegPi
Negative Pion match efficiency
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
TOF match data - 20190517
TOF match MC - 20190418
TOF match data AND MC - 20190517

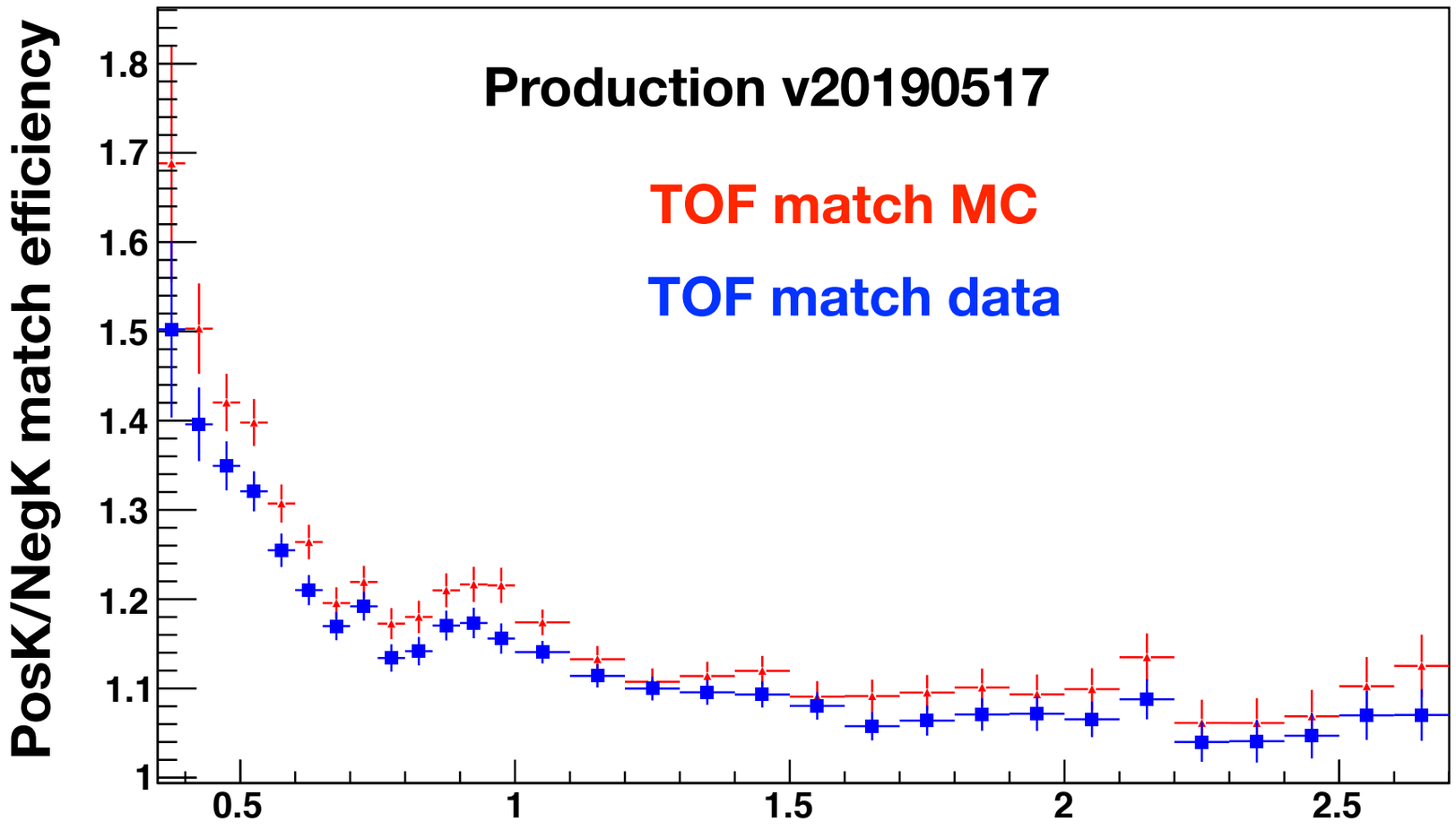

MatchEff_MB_PosK
Pos kaon match efficiency
0.6
0.5
0.4
0.3
0.2
0.1
0.5
1
1.5
2
2.5
3
TOF match data - 20190517
TOF match MC - 20190418
TOF match data AND MC - 20190517


MatchEff_MB_NegK
Neg kaon match efficiency
0.6
0.5
0.4
0.3
0.2
0.1
0
0.5
1
1.5
2
2.5
TOF match data - 20190517
TOF match MC - 20190418
TOF match data AND MC - 20190517

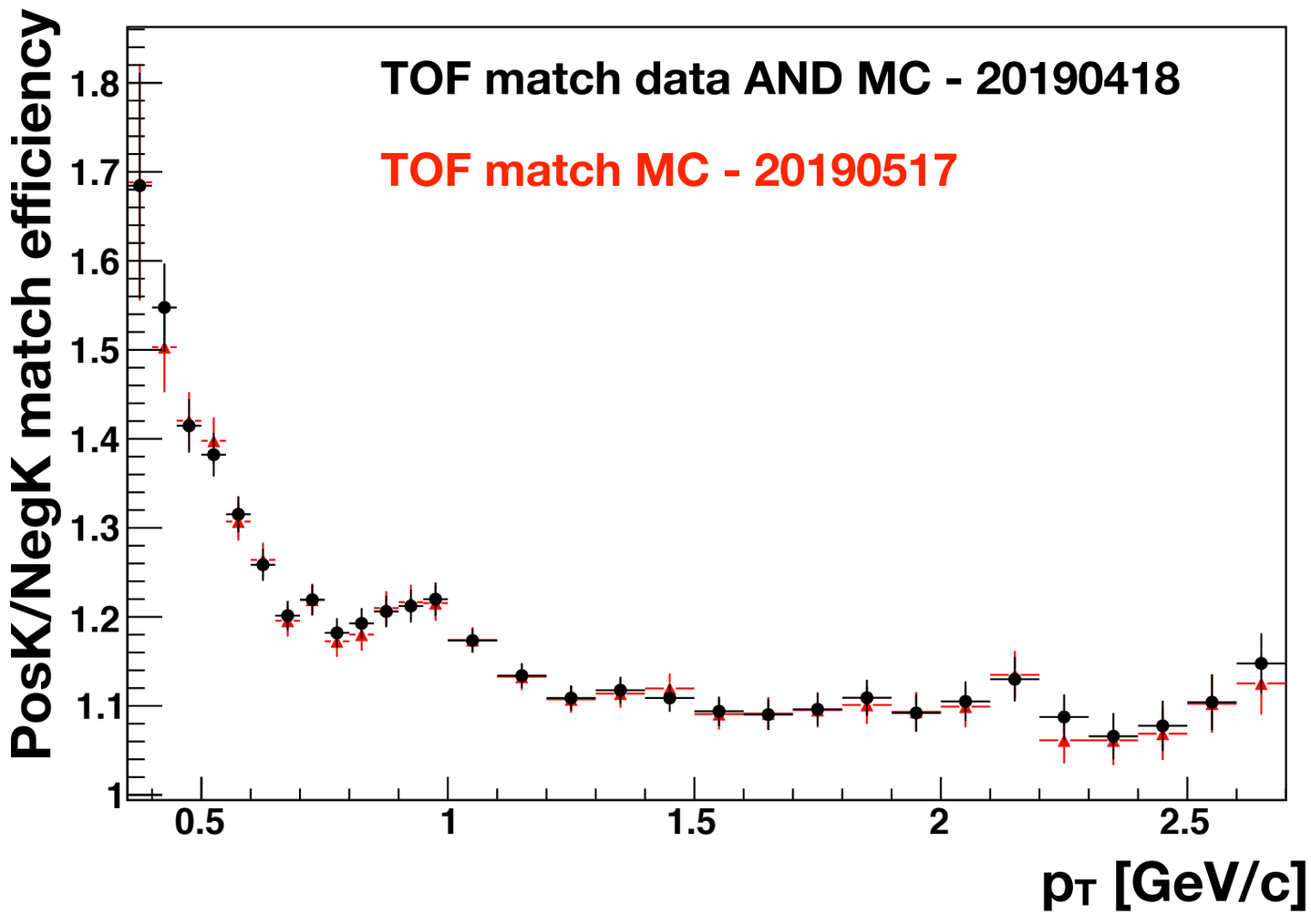

MatchEff_MB_PosP
Positive proton match efficiency
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
TOF match data - 20190517
TOF match MC - 20190418
TOF match data AND MC - 20190517


MatchEff_MB_NegP
Negative proton match efficiency
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.5
1
1.5
2
2.5
3
3.5
4
4.5
TOF match data - 20190517
TOF match MC - 20190418
TOF match data AND MC - 20190517

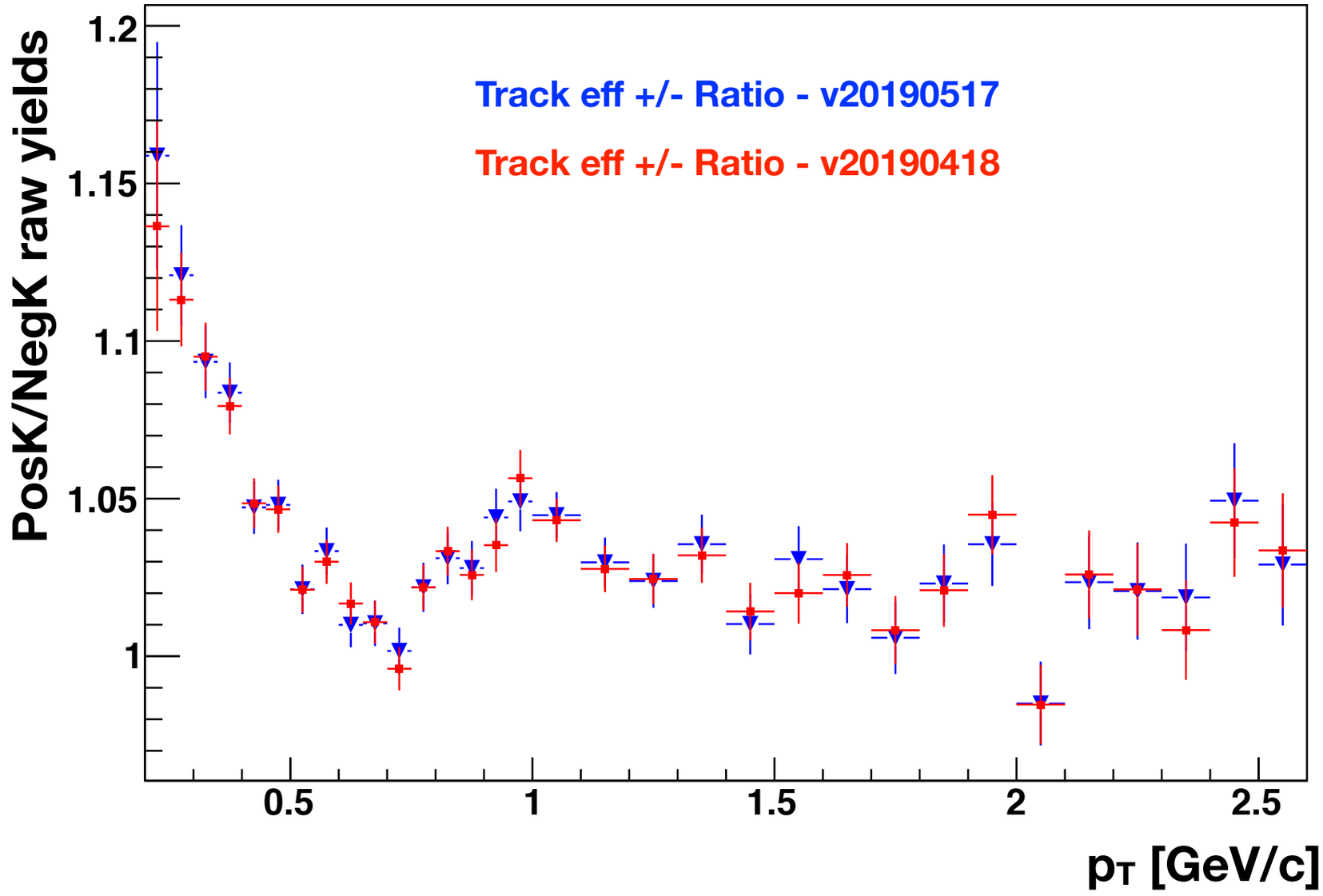
MatchEff_MB_PosK



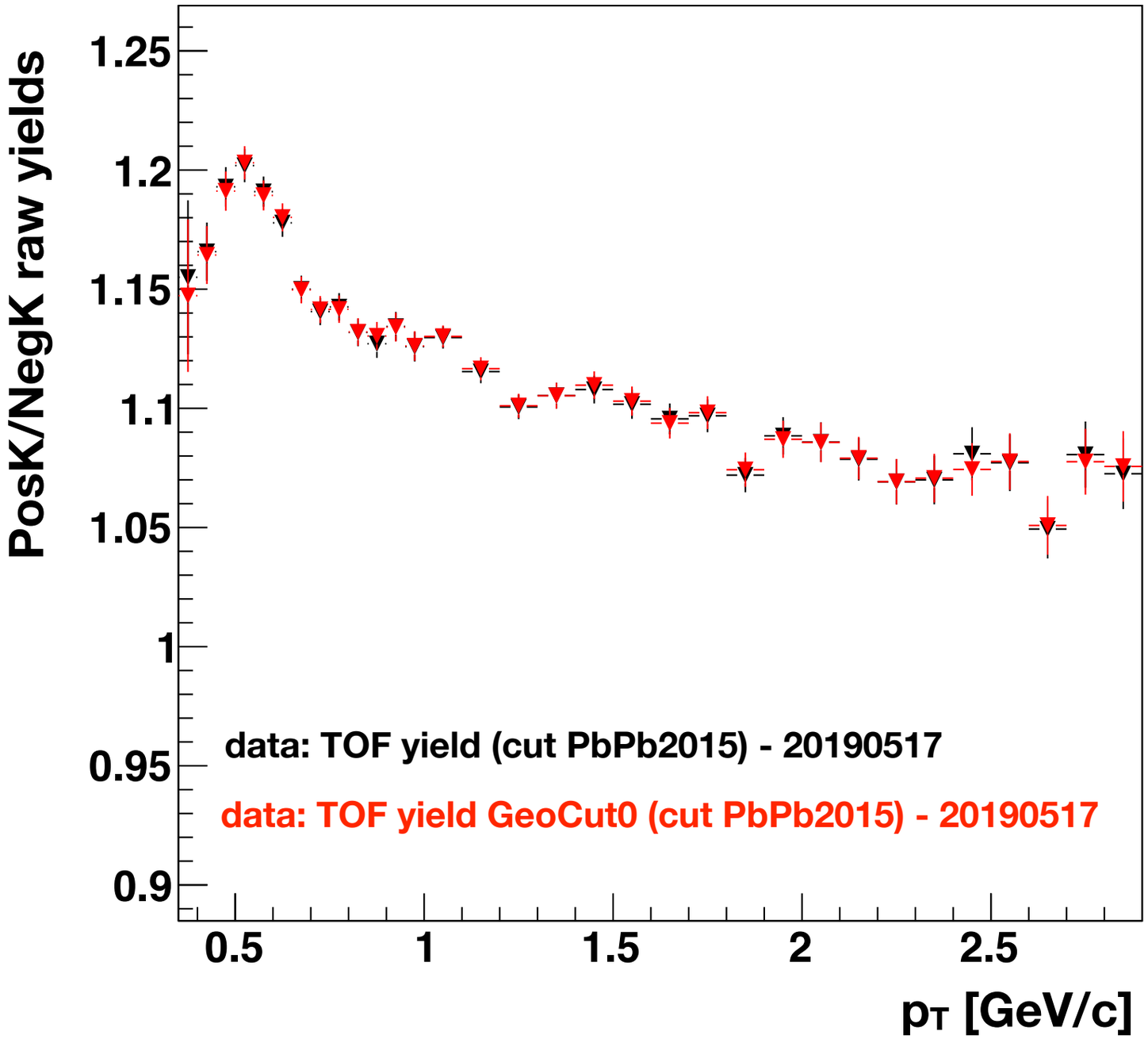
MatchEff_MB_PosK



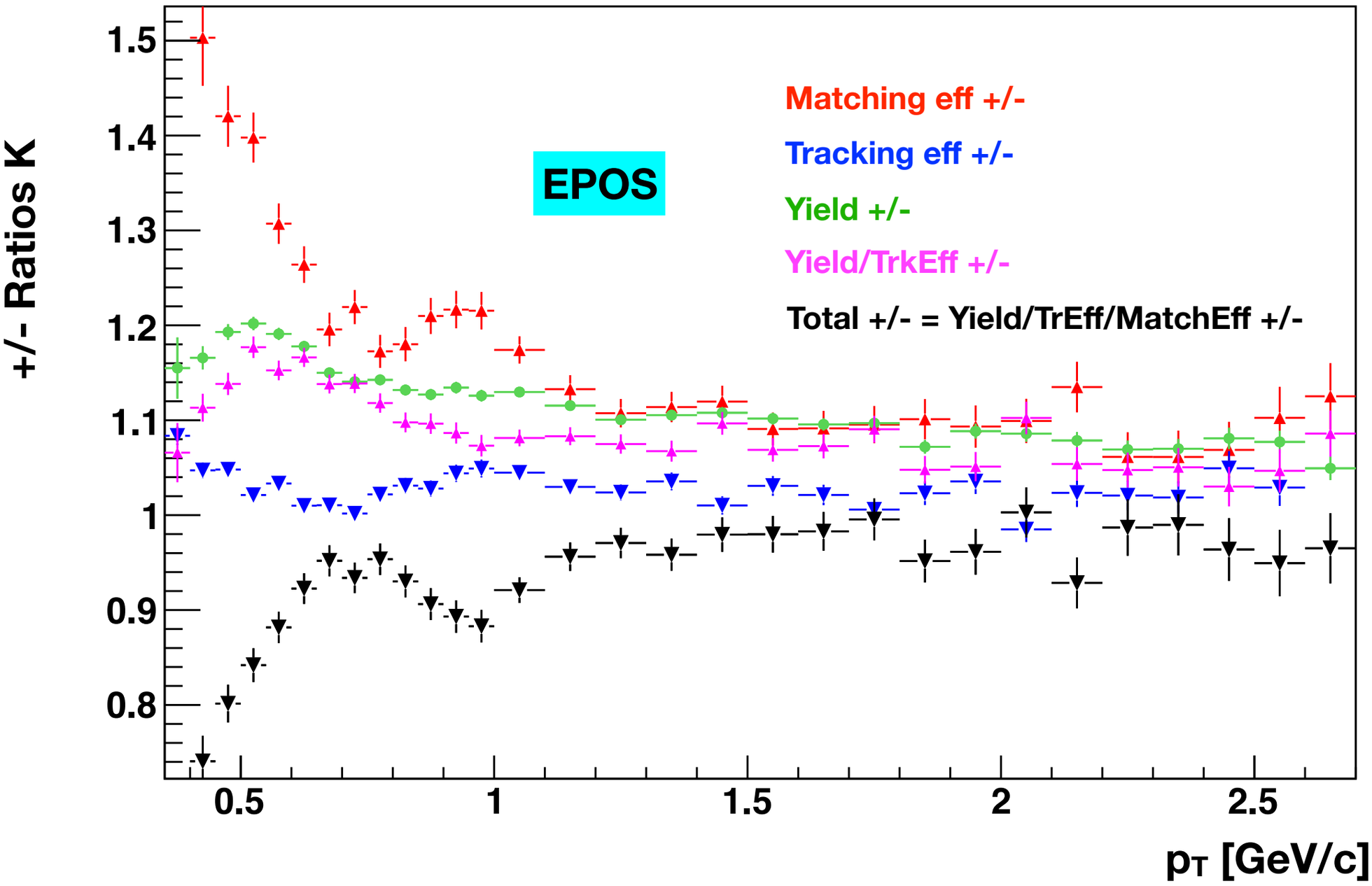
TrackEff_MB_PosK



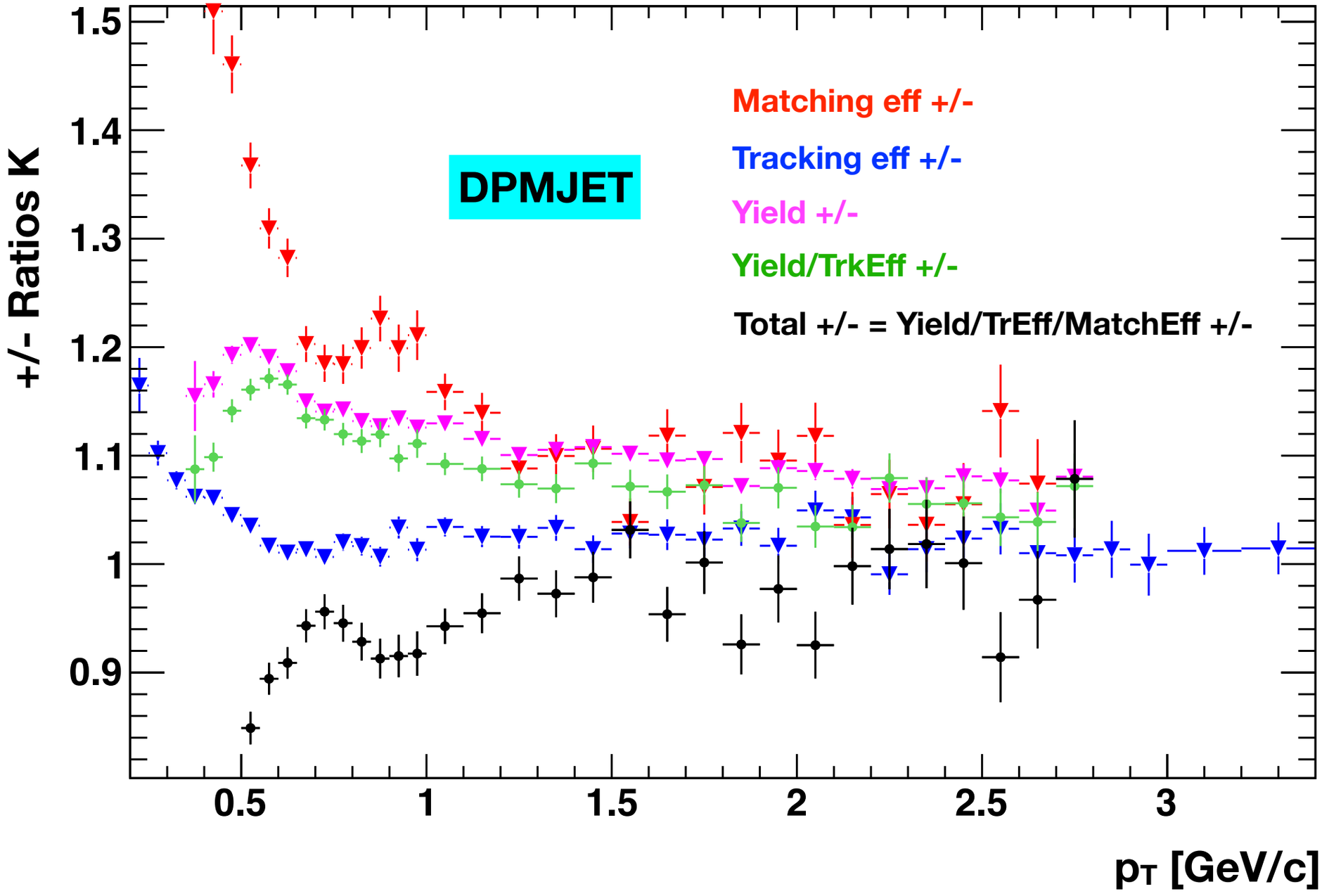
Raw Spectra for K^+



MatchEff_MB_PosK



TrackEff_MB_PosK



Raw Spectra for p

+/- Ratios protons

EPOS

Matching eff +/-

Tracking eff +/-

Yield +/-

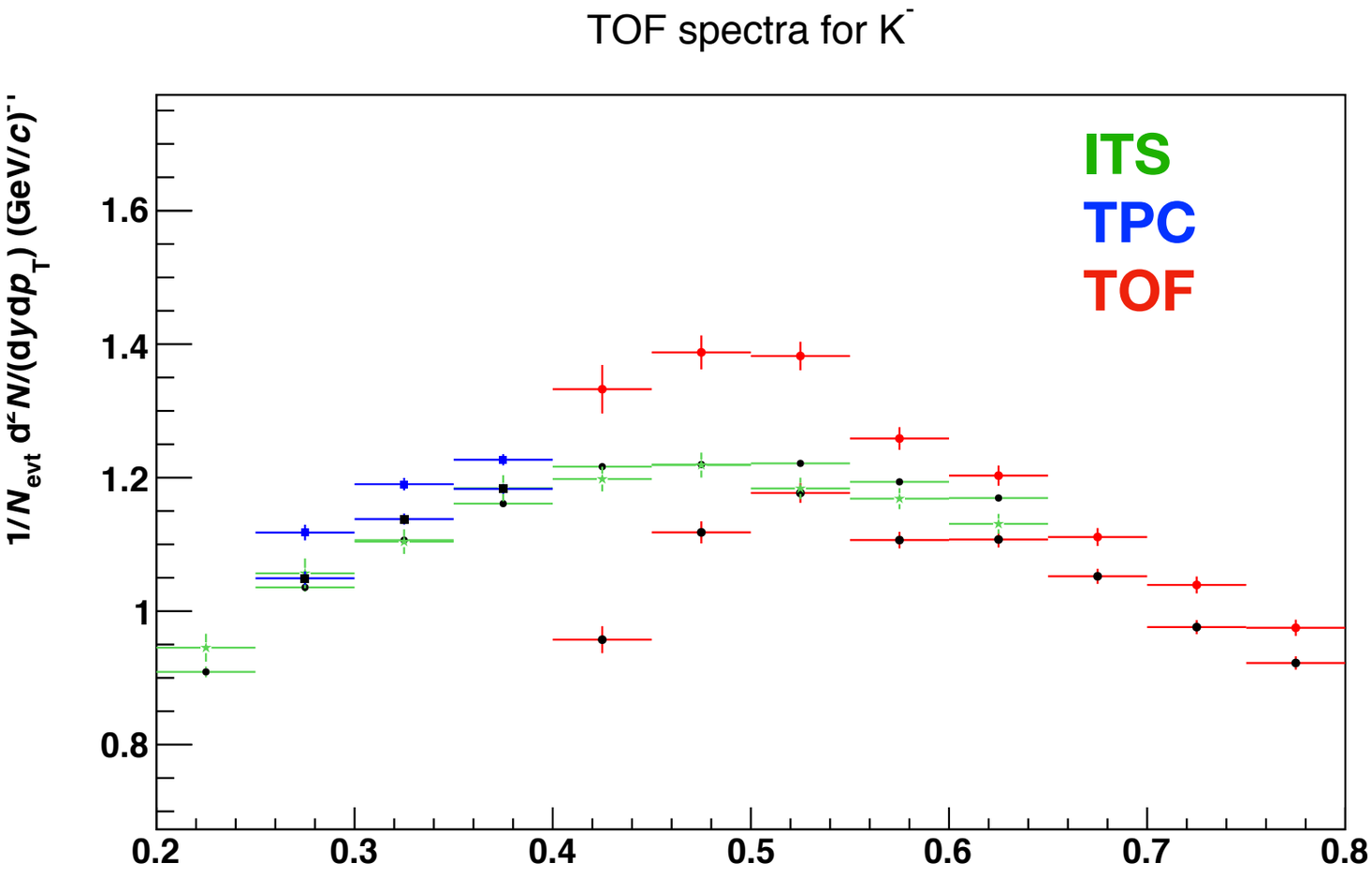
Yield/TrkEff +/-

Total +/- = Yield/TrEff/MatchEff +/-

1.6
1.5
1.4
1.3
1.2
1.1
1
0.9
0.8

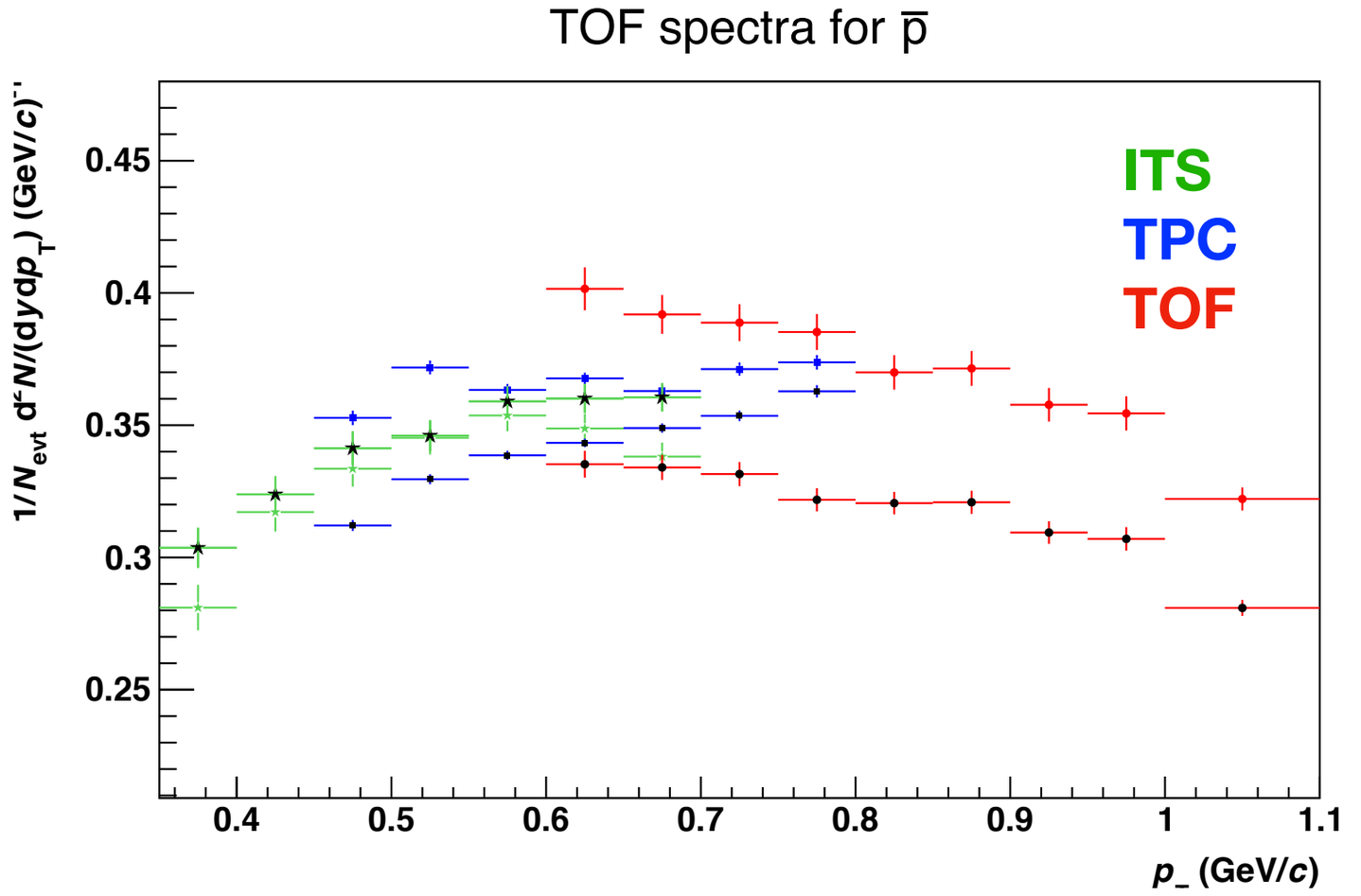
0.5
1
1.5
2
2.5
3
3.5
4

p_T [GeV/c]

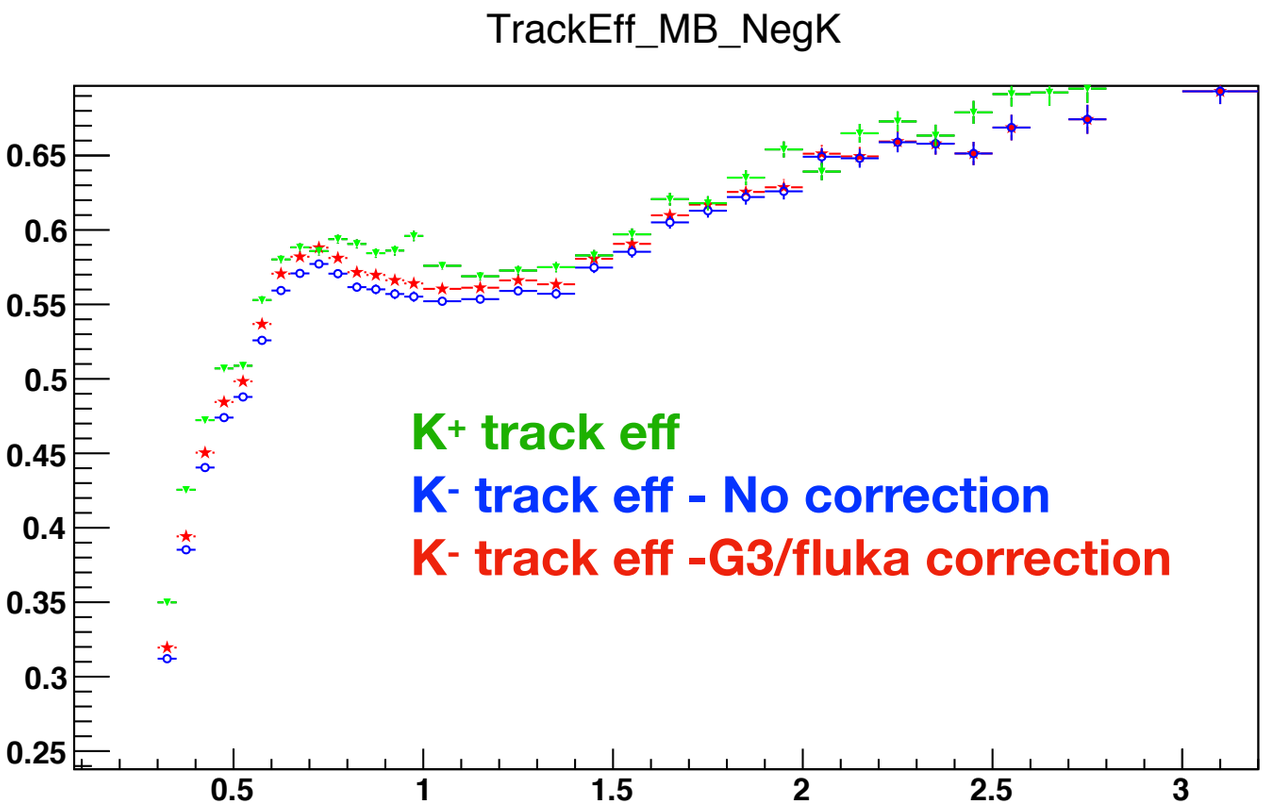


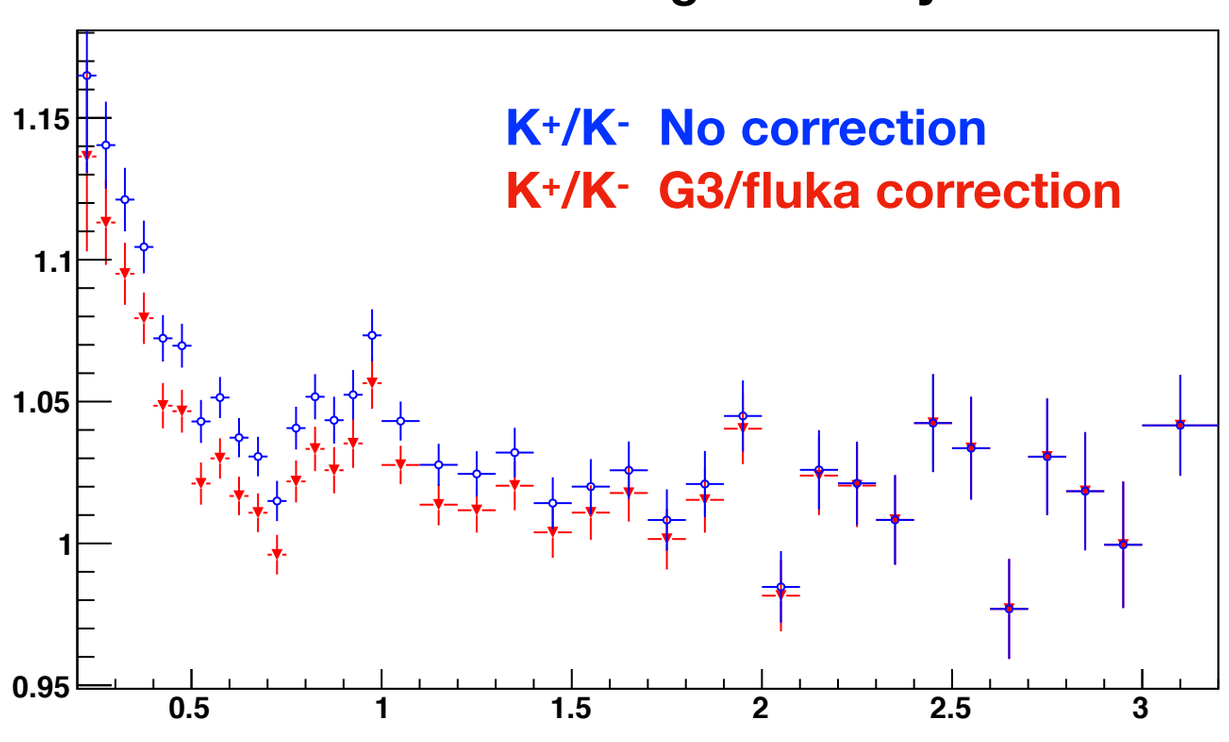
- **Marker nero, linee colorate: positive**
- **Marker e linee colorate: negative**

Un po' posso avvicinare il rapporto pos/neg verso 1 sfruttando la combinazione con le altre analisi: ma questo è possibile solo fino a 0.65 GeV per i K e 0.8 per i p. Dopo i 0.6 GeV per i K il rapporto pos/neg>0.92 quindi accettabile, ma per i protoni è ancora circa 0.86 !!

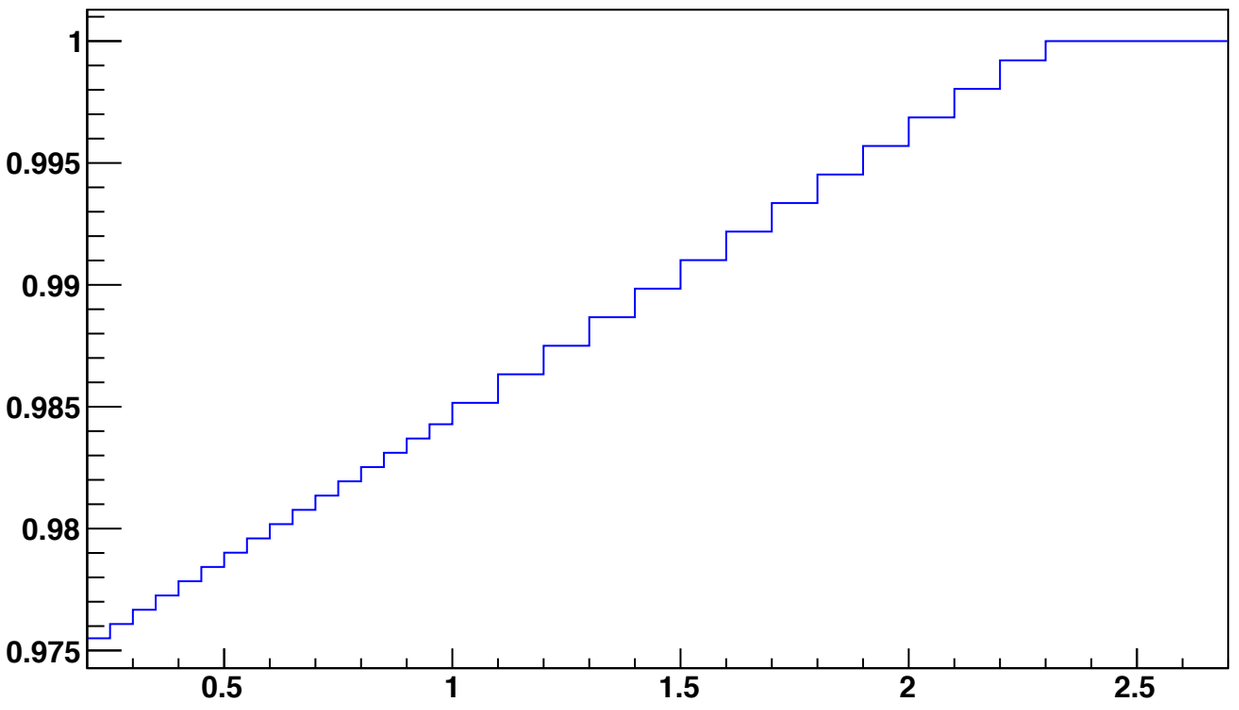


Tracking efficiency kaons

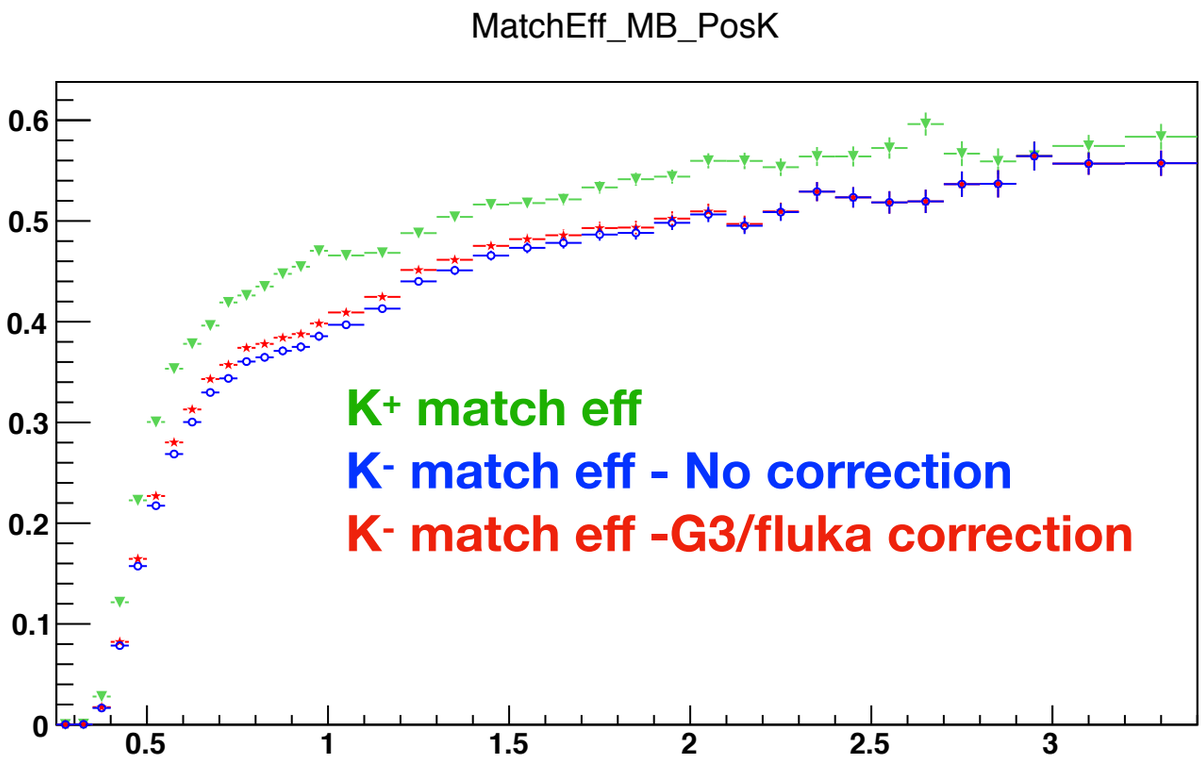


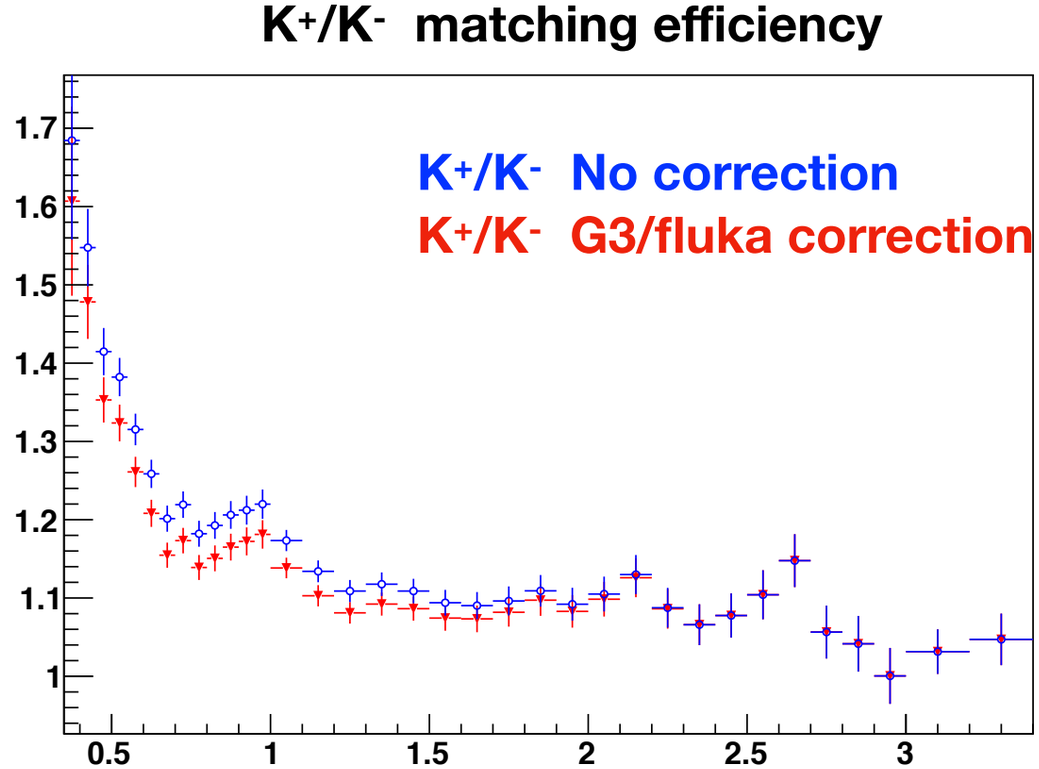


Rapporto tra la curva di efficienza senza correzione e quella con correzione: si ritrova la funzione di correzione G3/Fluka

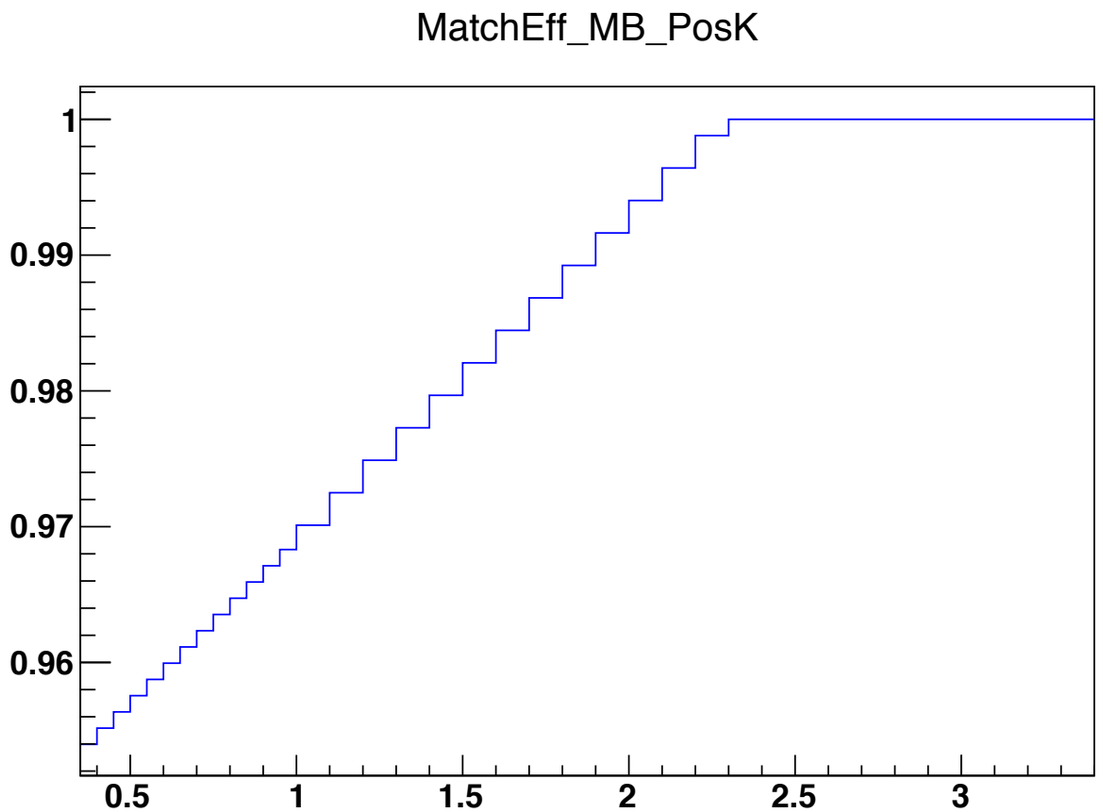


Matching efficiency kaons

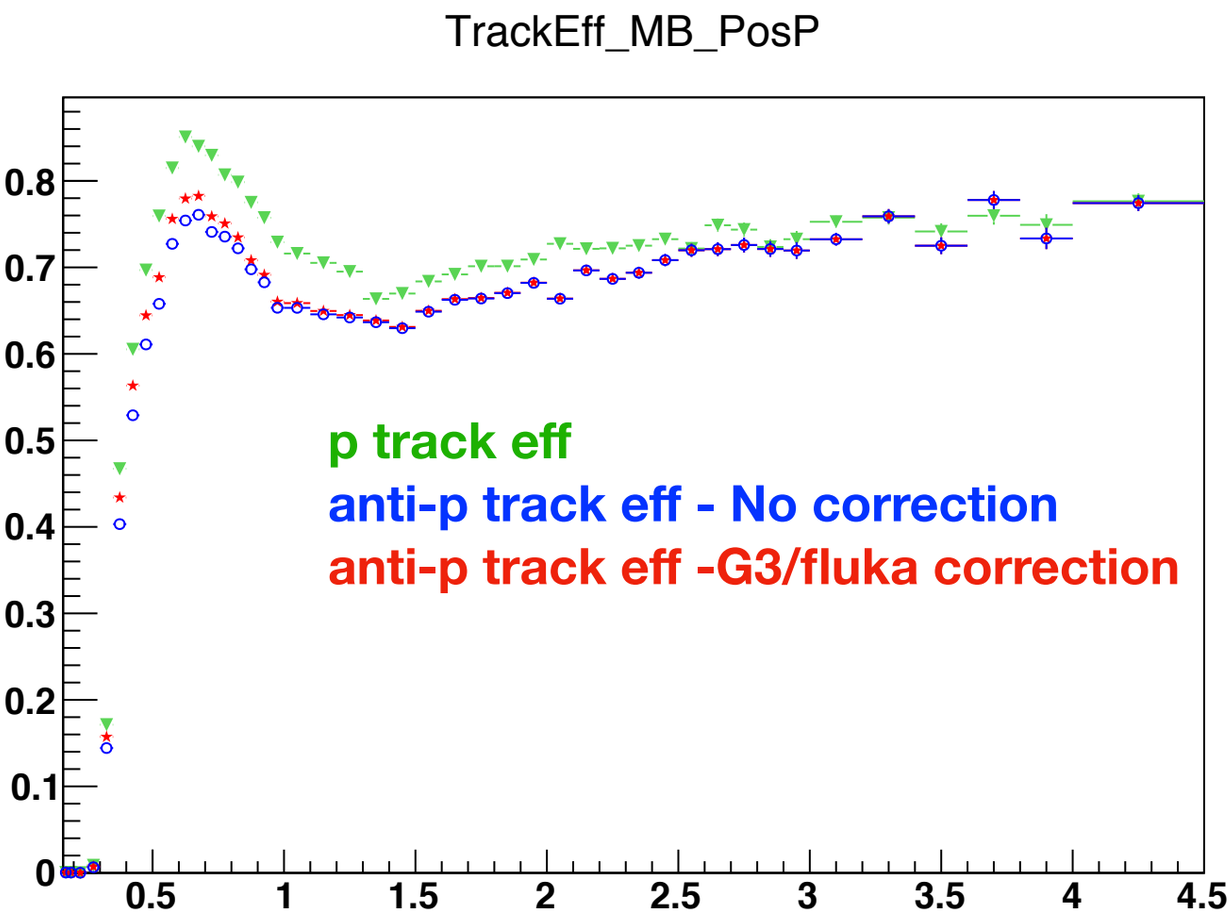


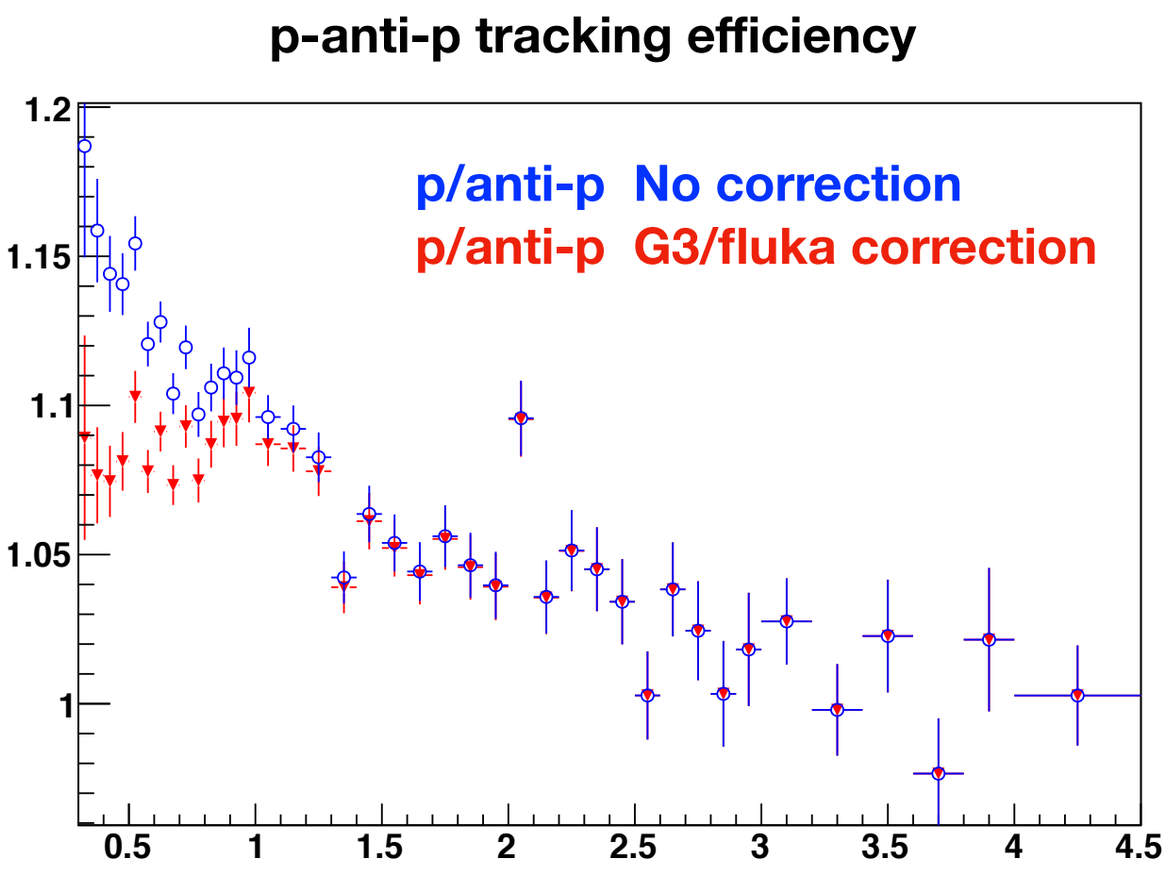


Rapporto tra la curva di efficienza senza correzione e quella con correzione: si ritrova la funzione di correzione G3/Fluka per la matching efficiency

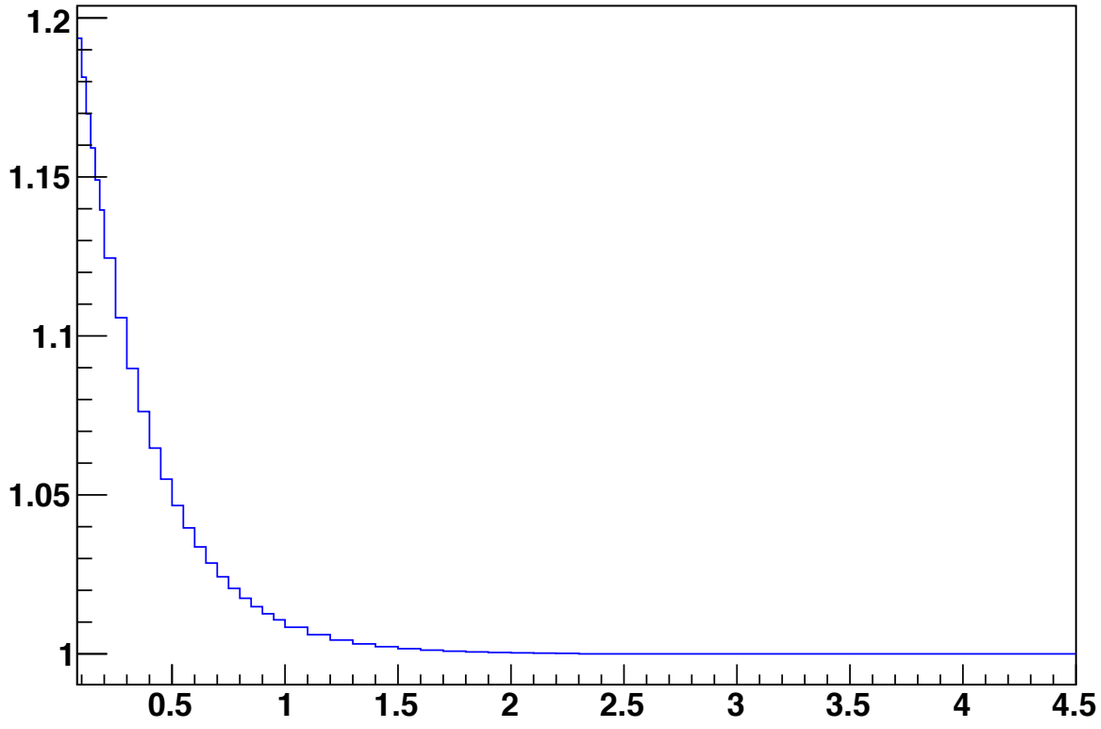


Tracking efficiency protons

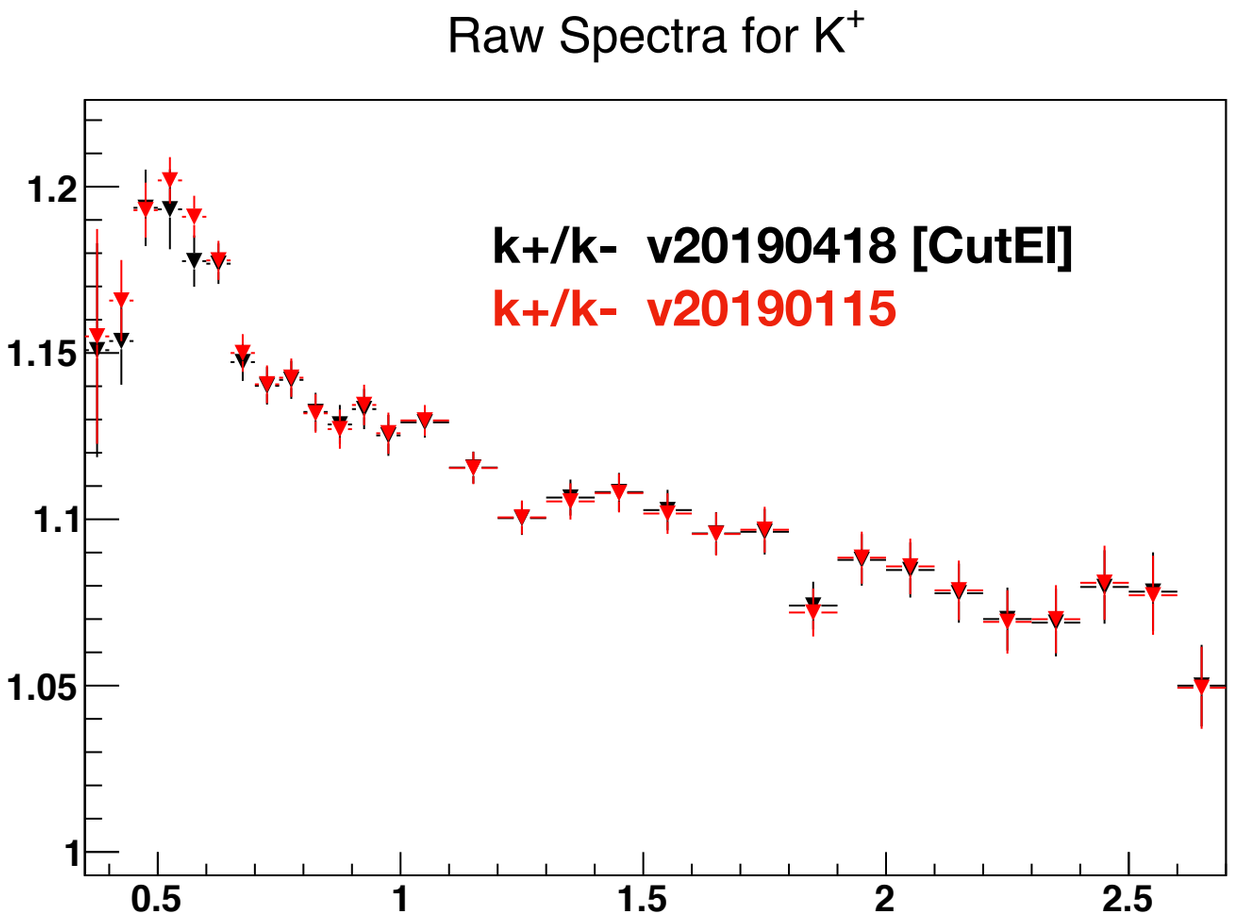


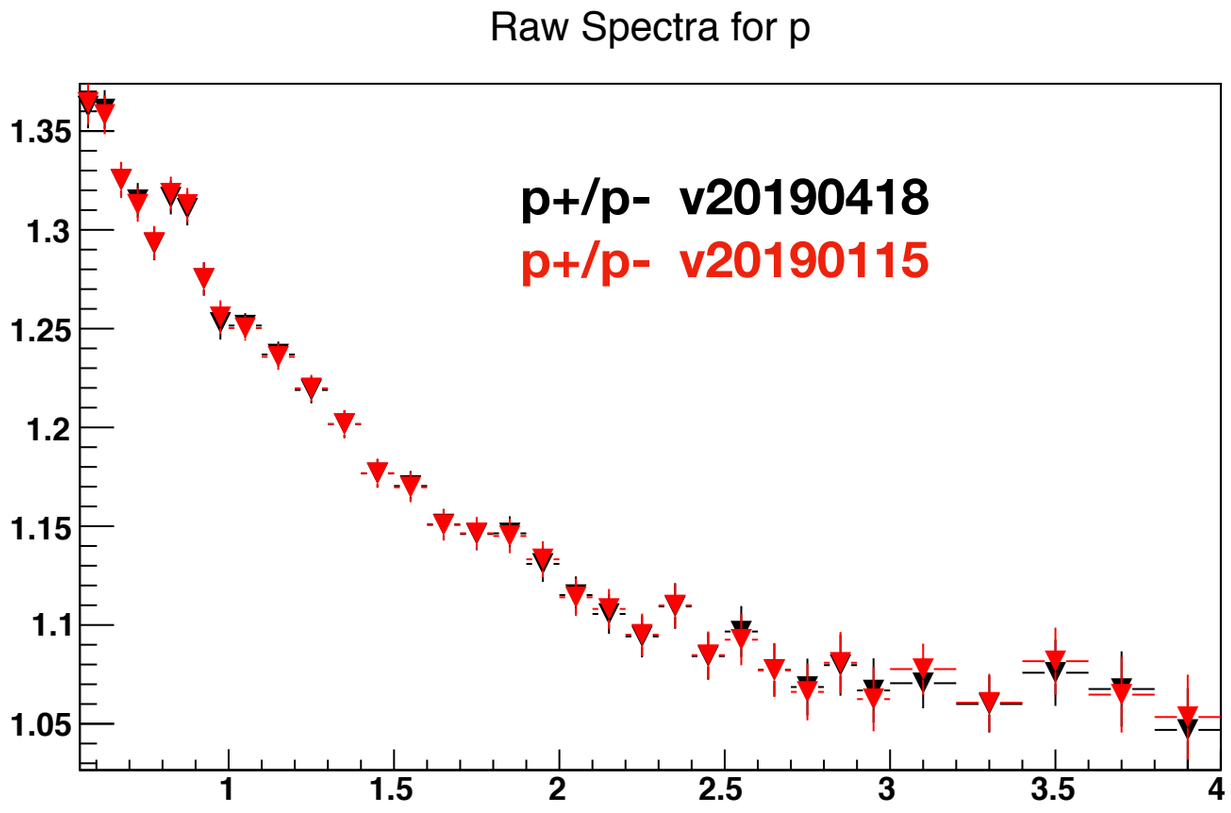


Rapporto tra la curva di efficienza senza correzione e quella con correzione: si ritrova la funzione di correzione G3/Fluka per la tracking efficiency

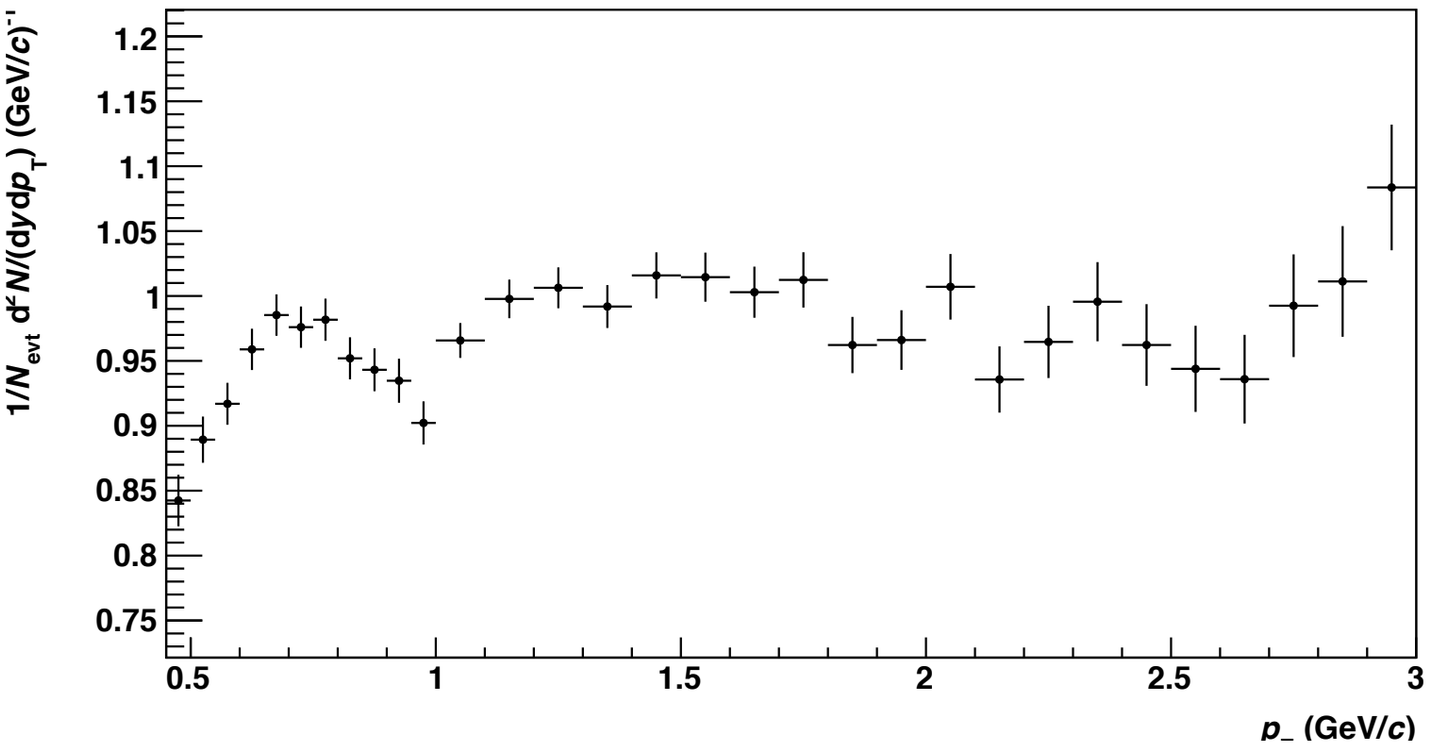


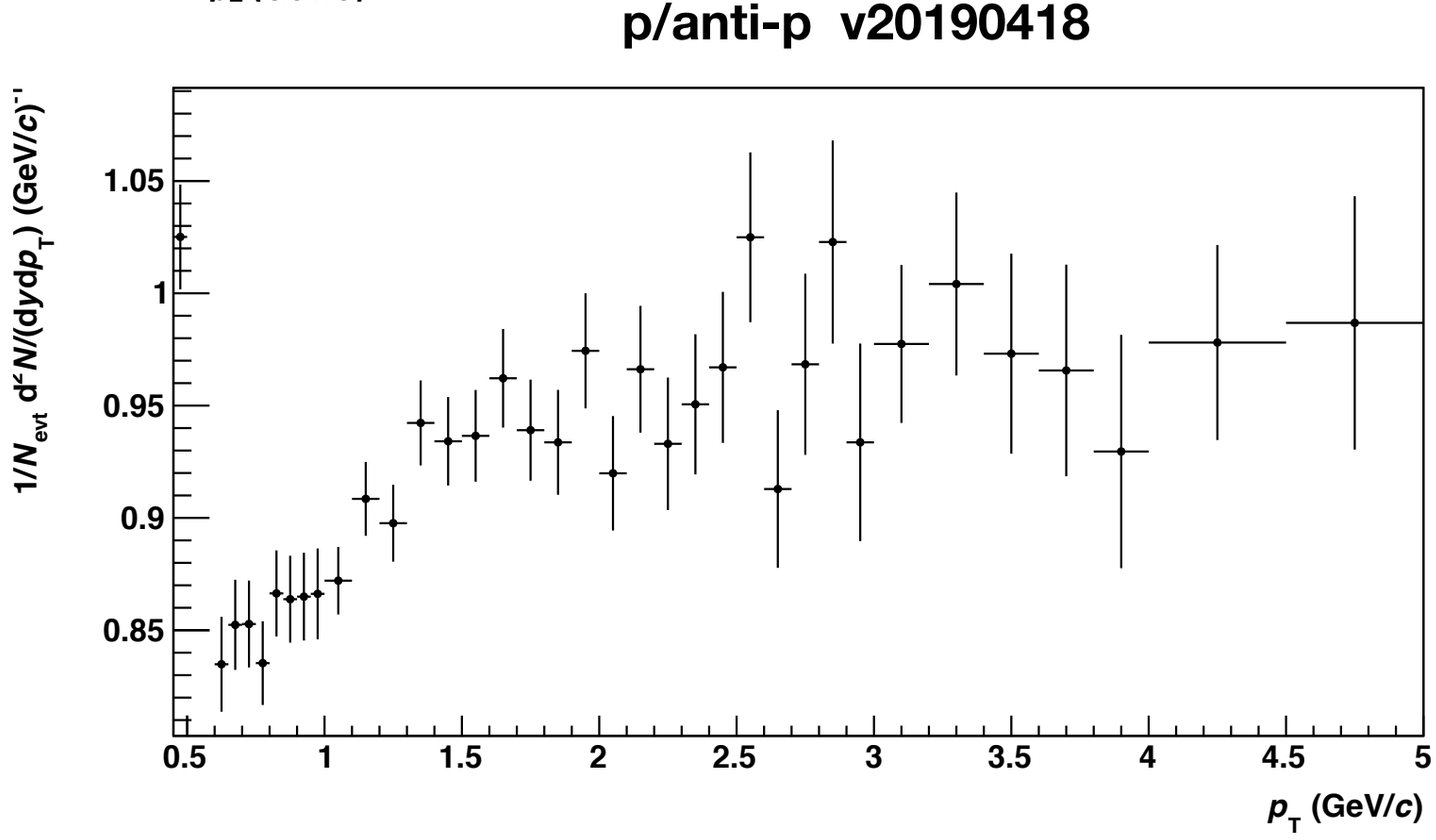
Raw Yields ratios



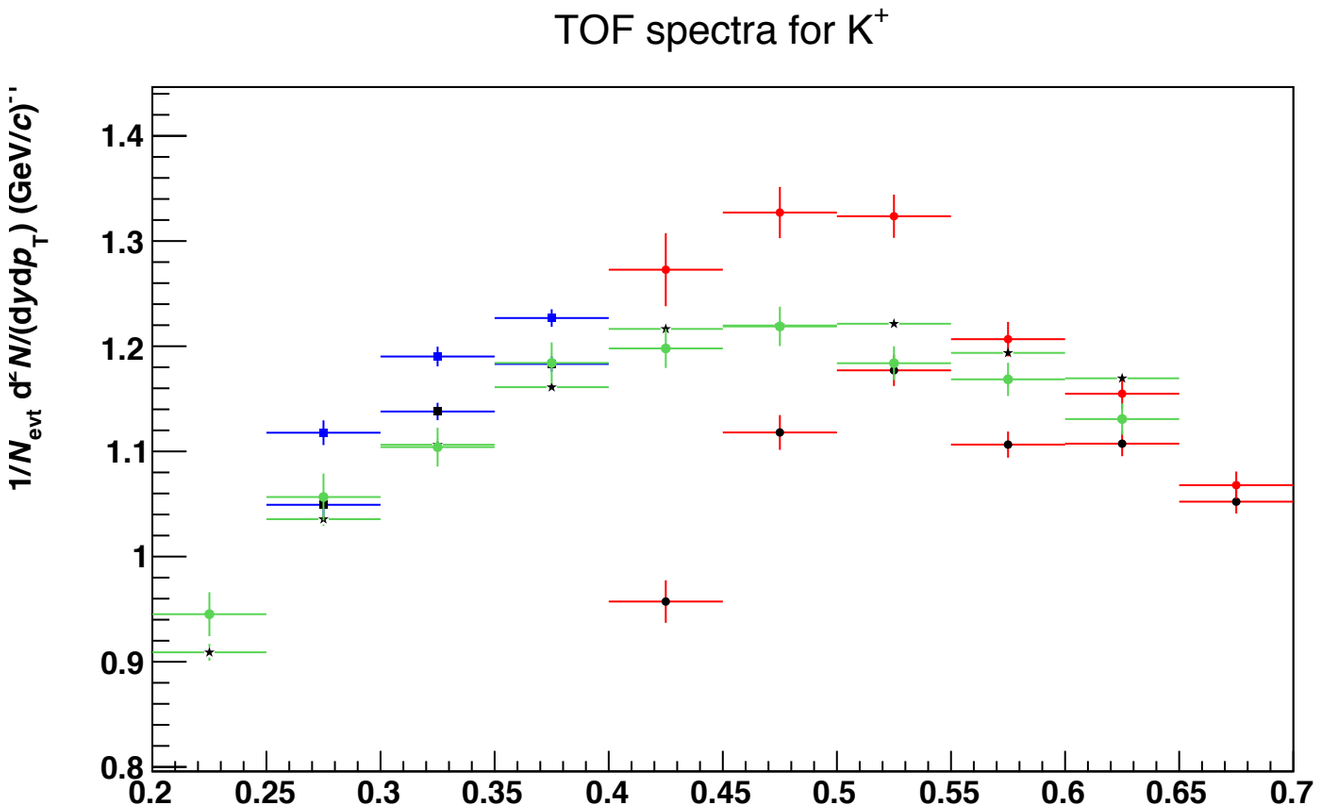


Ratio positive/negative: TOF

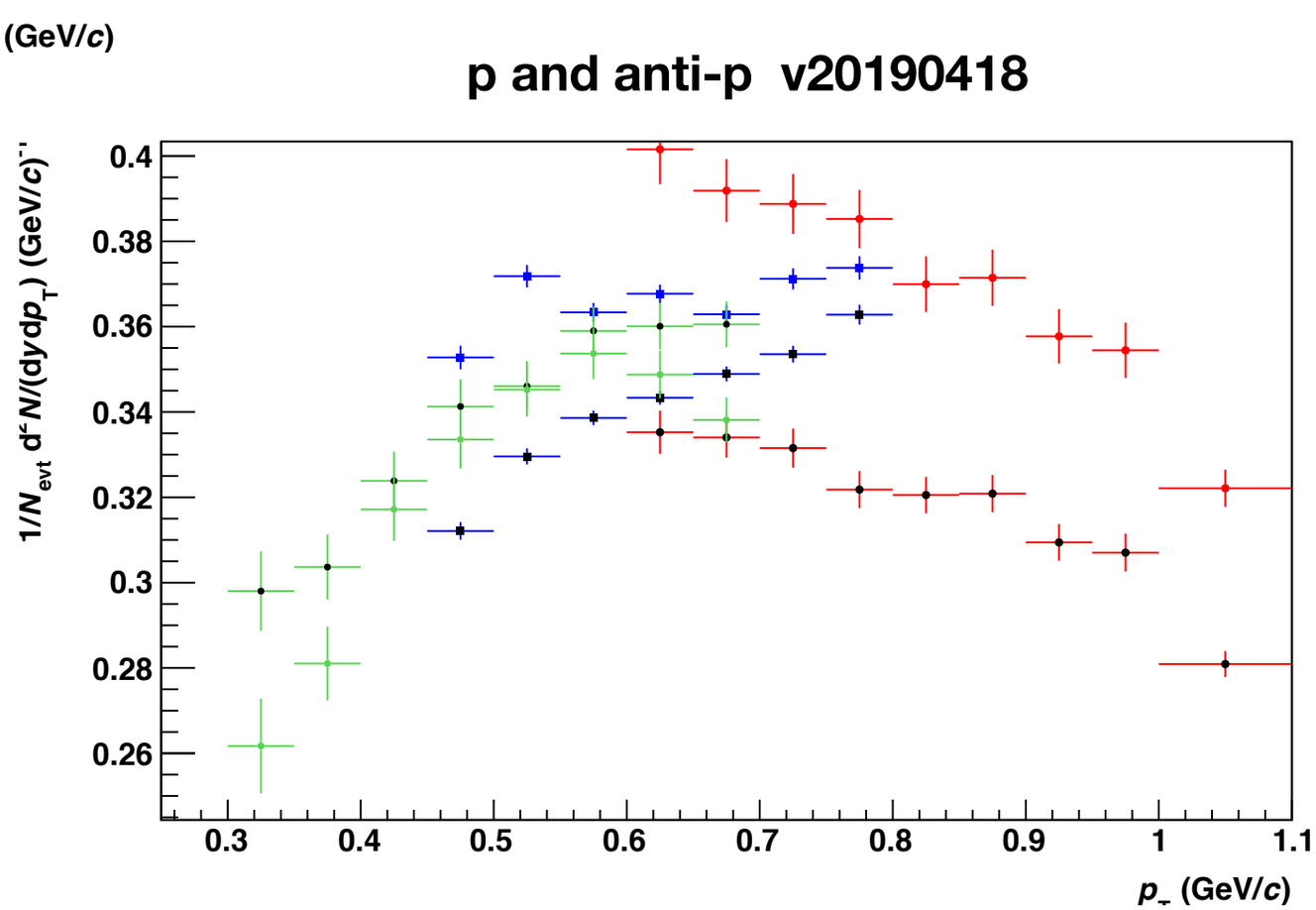


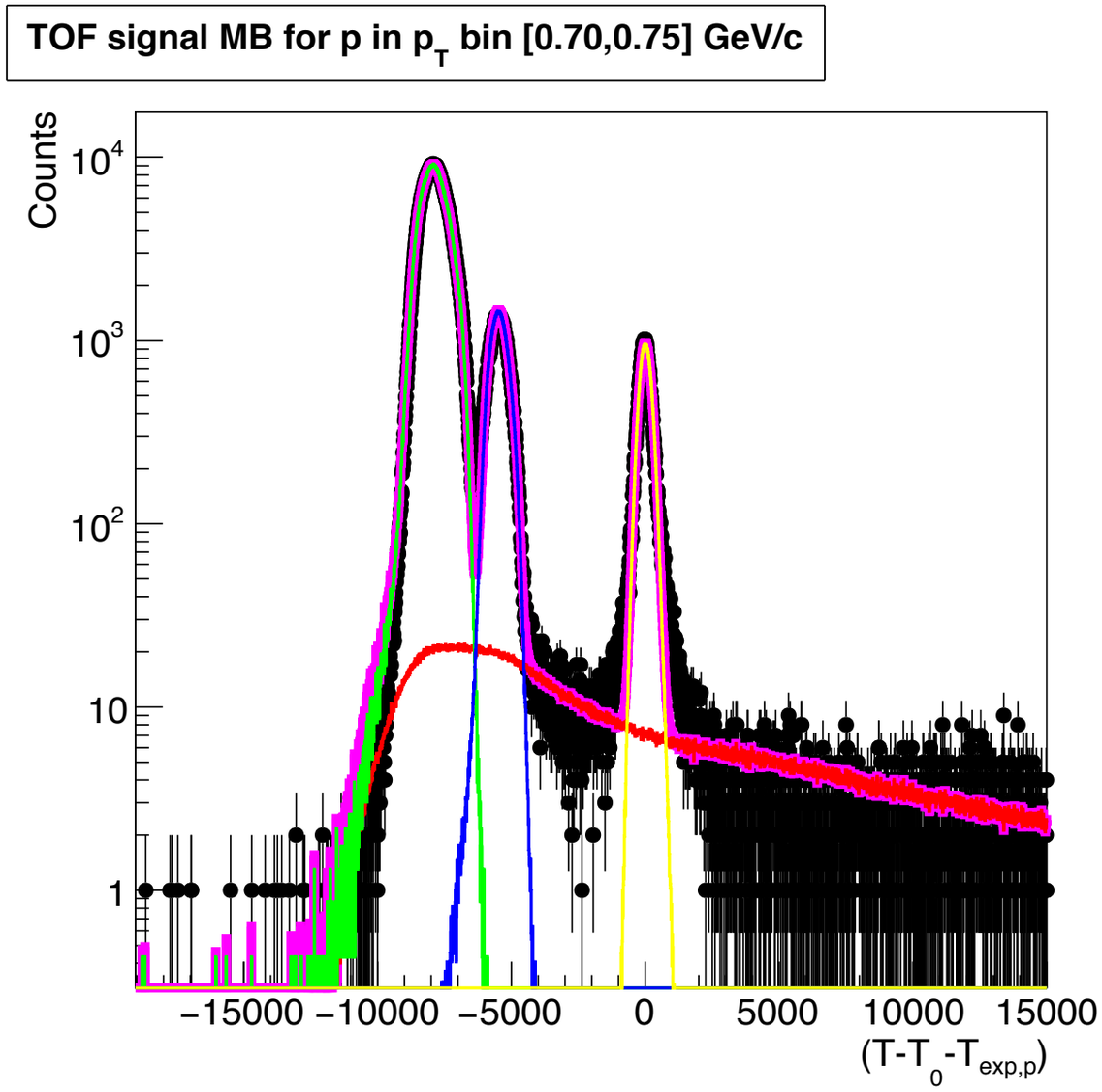


Ratio positive/negative: combination

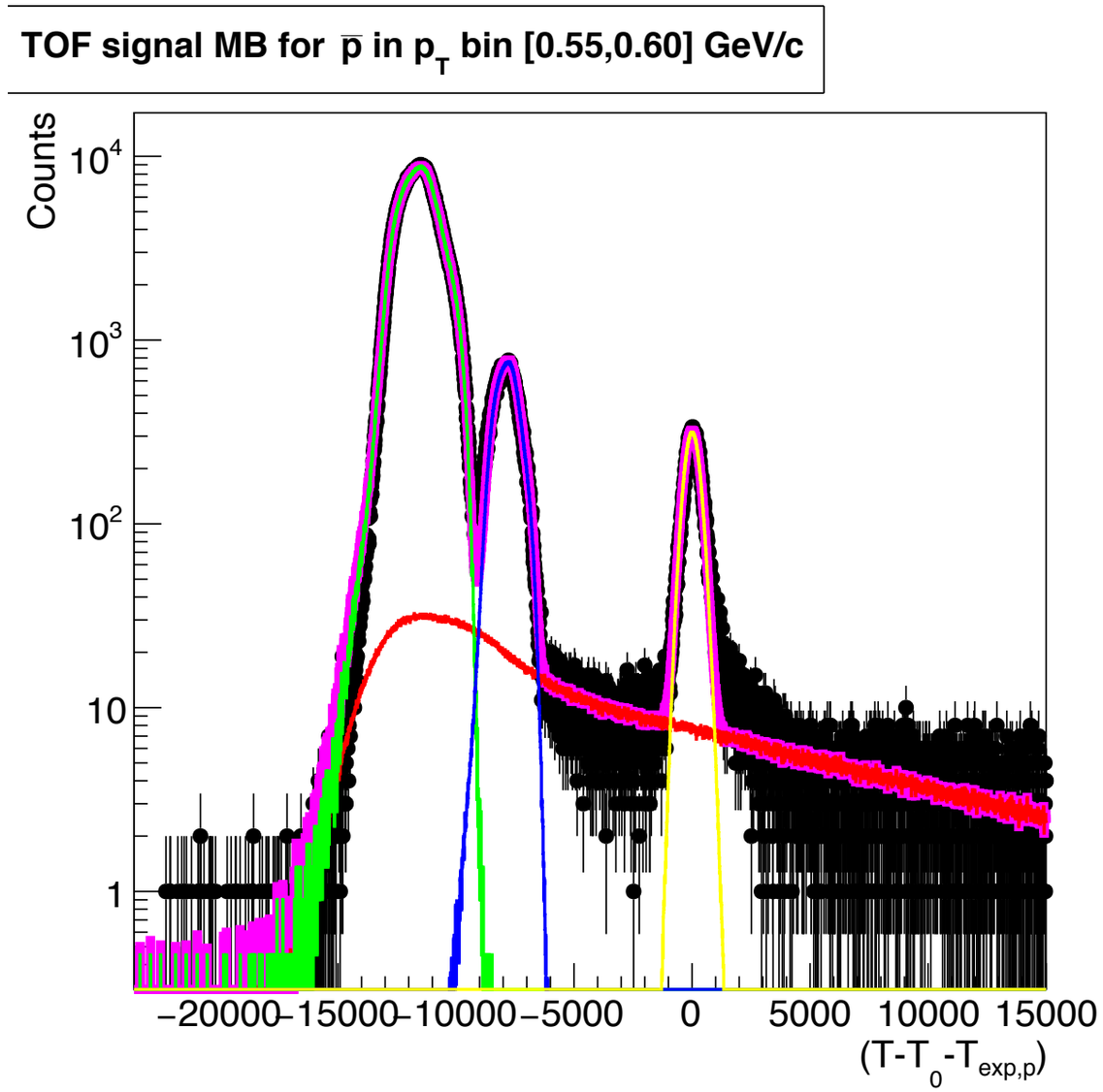


- **Marker nero, linee colorate: positive**
- **Marker e linee colorate: negative**



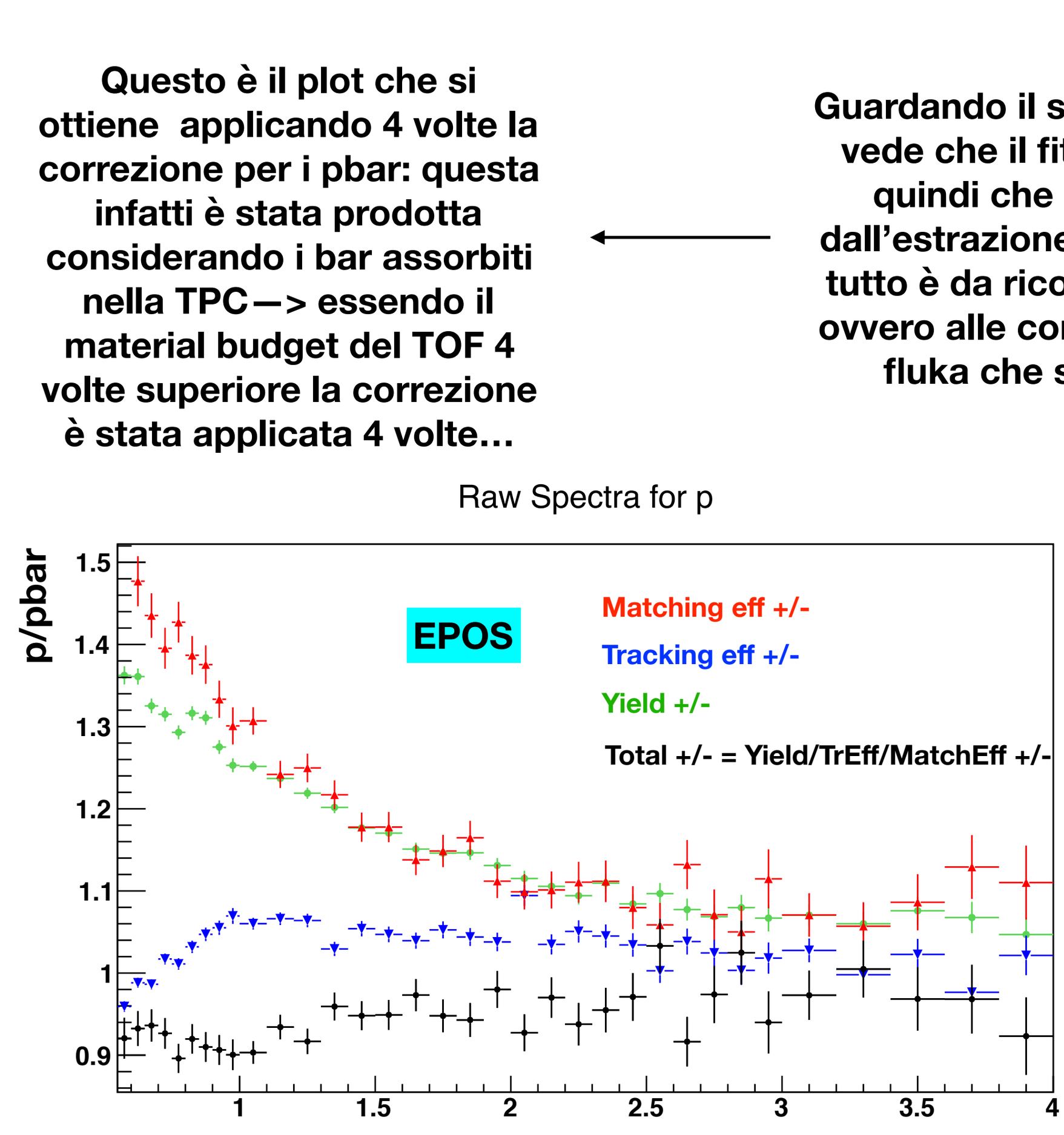


Guardando il segnale dei protoni si vede che il fit è buono: escludo quindi che il problema viene dall'estrazione degli yields raw—> tutto è da ricondursi all'efficienza ovvero alle correzioni G3/G4 e G3/ fluka che si stanno usando



Questo è il plot che si ottiene applicando 4 volte la correzione per i pbar: questa infatti è stata prodotta considerando i bar assorbiti nella TPC—> essendo il material budget del TOF 4 volte superiore la correzione è stata applicata 4 volte…

Guardando il segnale dei protoni si vede che il fit è buono: escludo quindi che il problema viene dall'estrazione degli yields raw—> tutto è da ricondursi all'efficienza ovvero alle correzioni G3/G4 e G3/fluka che si stanno usando



Raw Spectra for p

+/- Ratios protons

EPOS

Matching eff +/-

Tracking eff +/-

Yield +/-

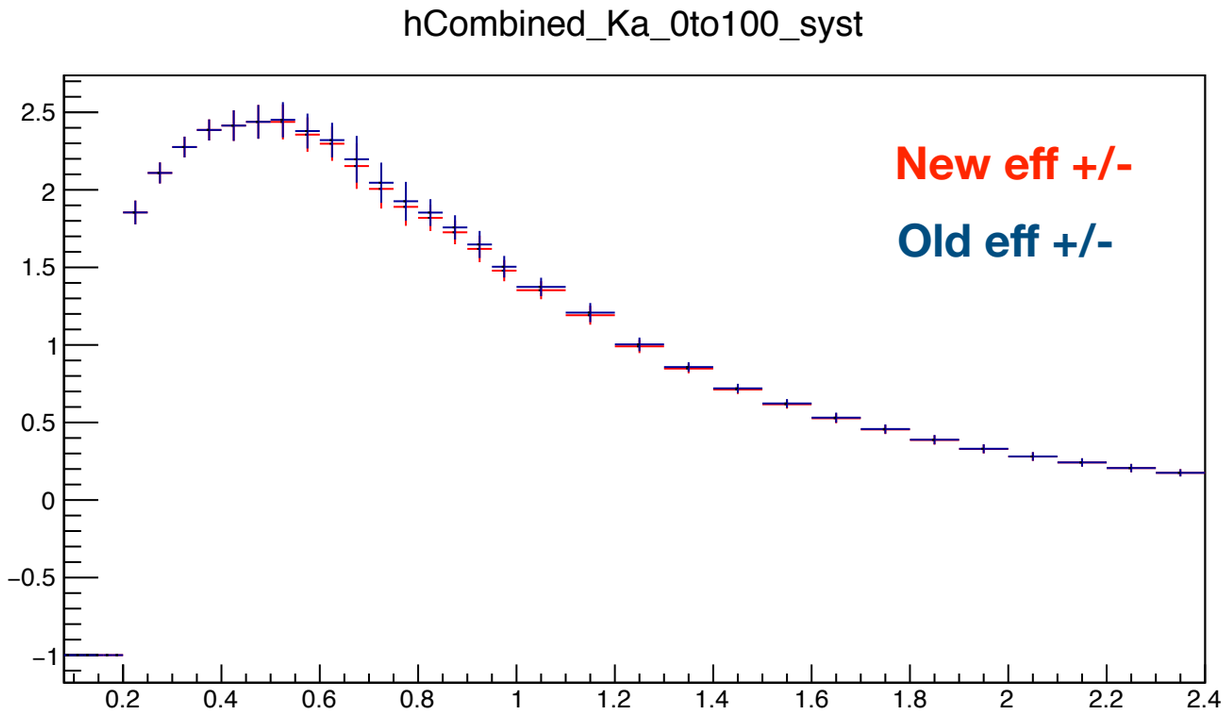
Yield/TrkEff +/-

Total +/- = Yield/TrEff/MatchEff +/-

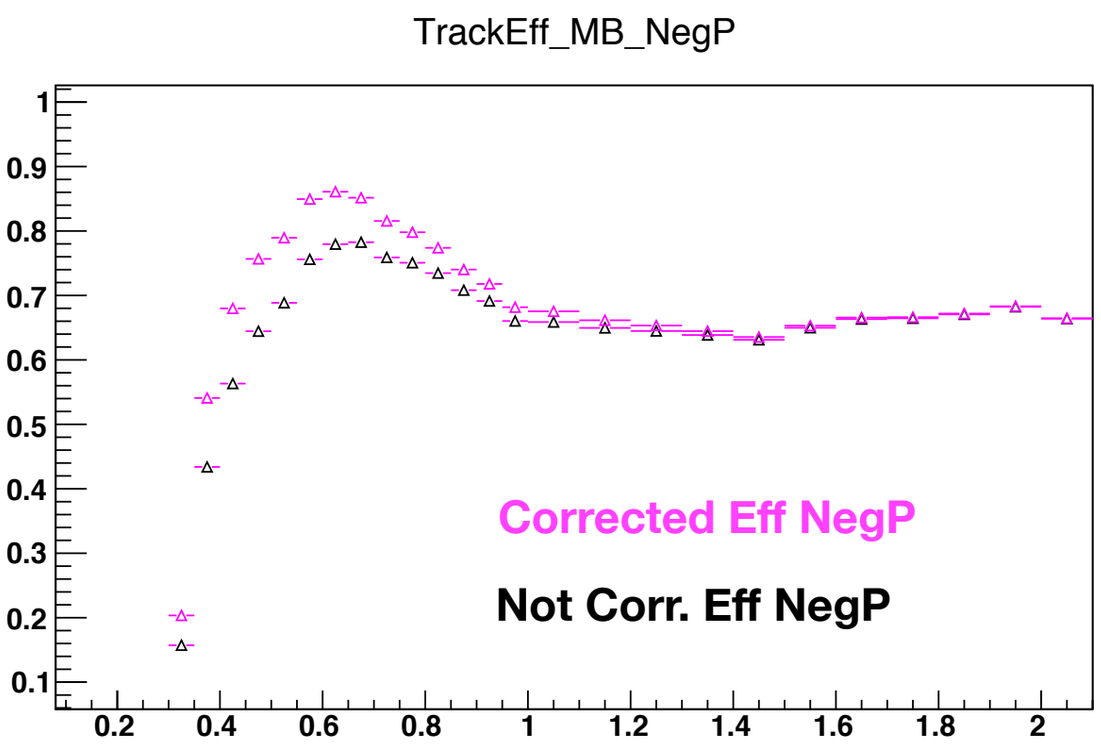
1.6
1.5
1.4
1.3
1.2
1.1
1
0.9
0.8

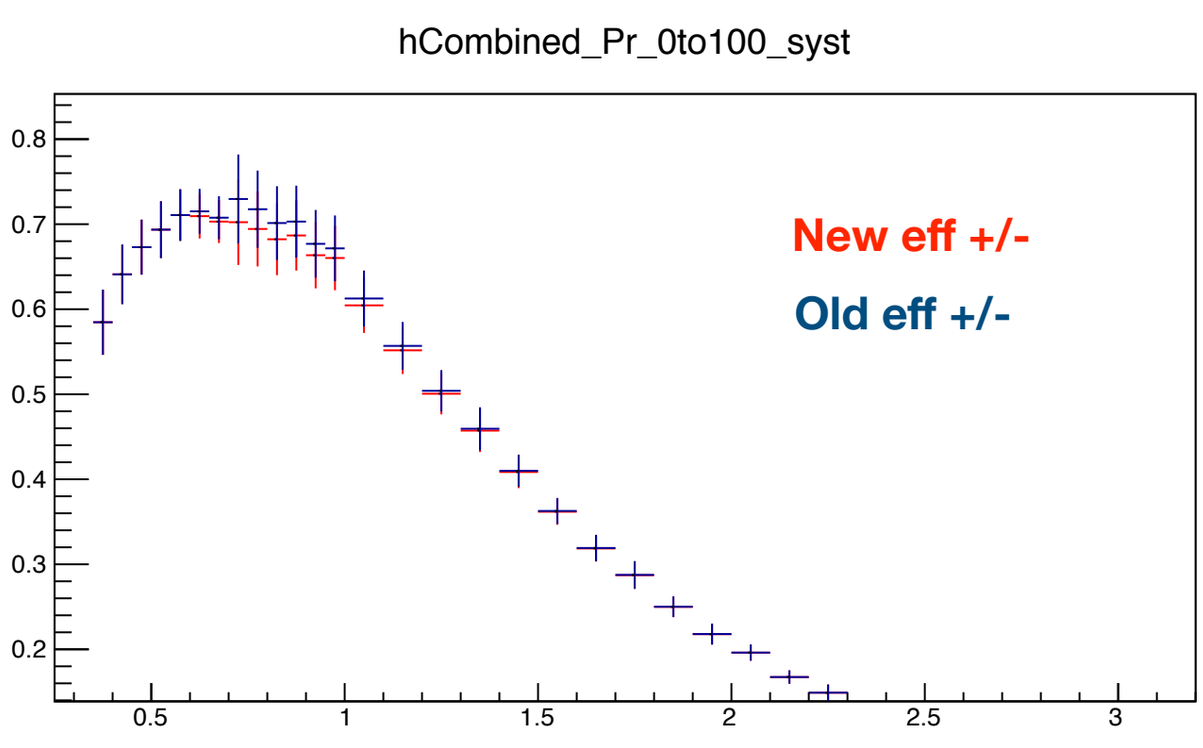
0.5
1
1.5
2
2.5
3
3.5
4

p_T [GeV/c]

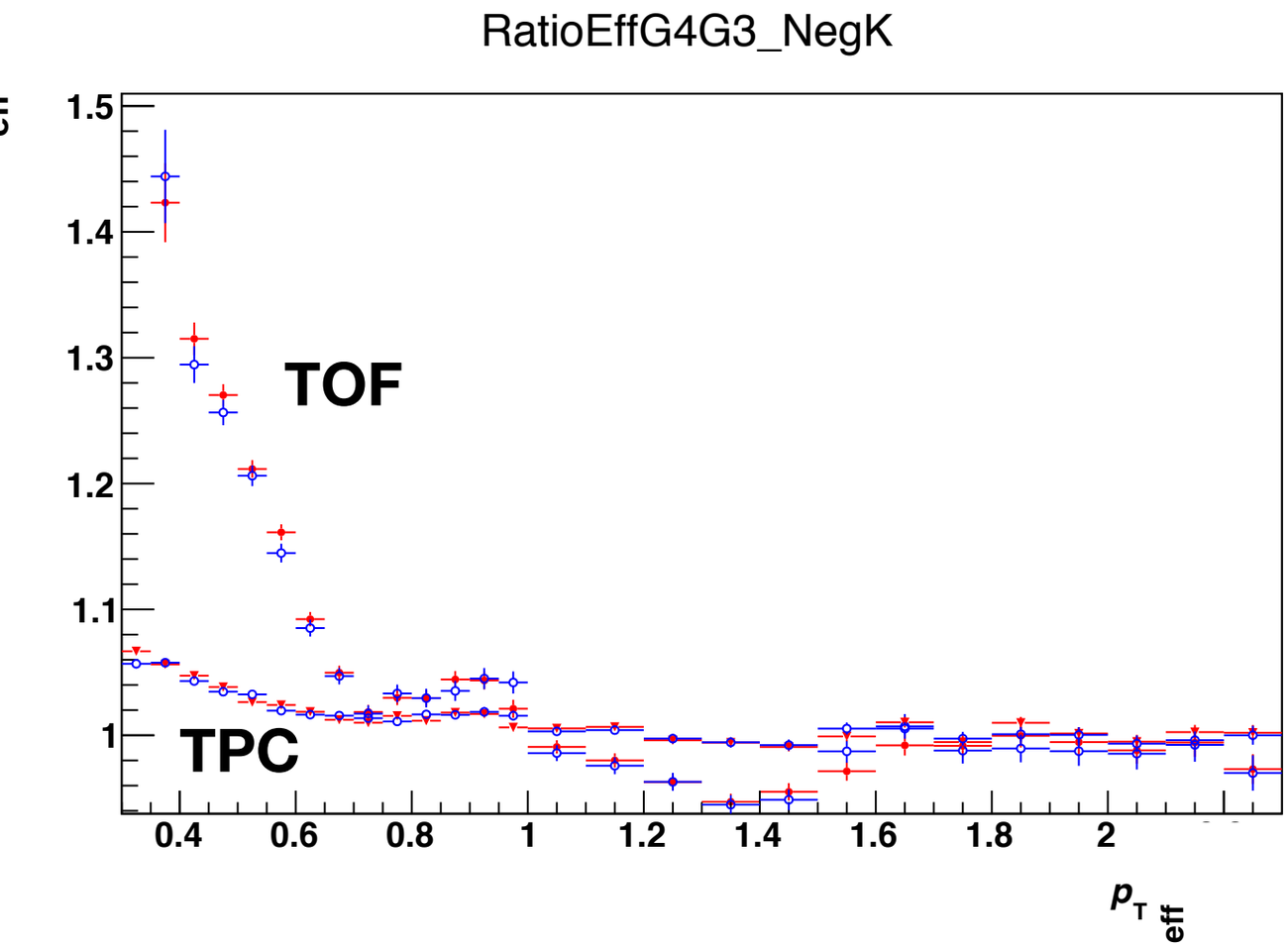


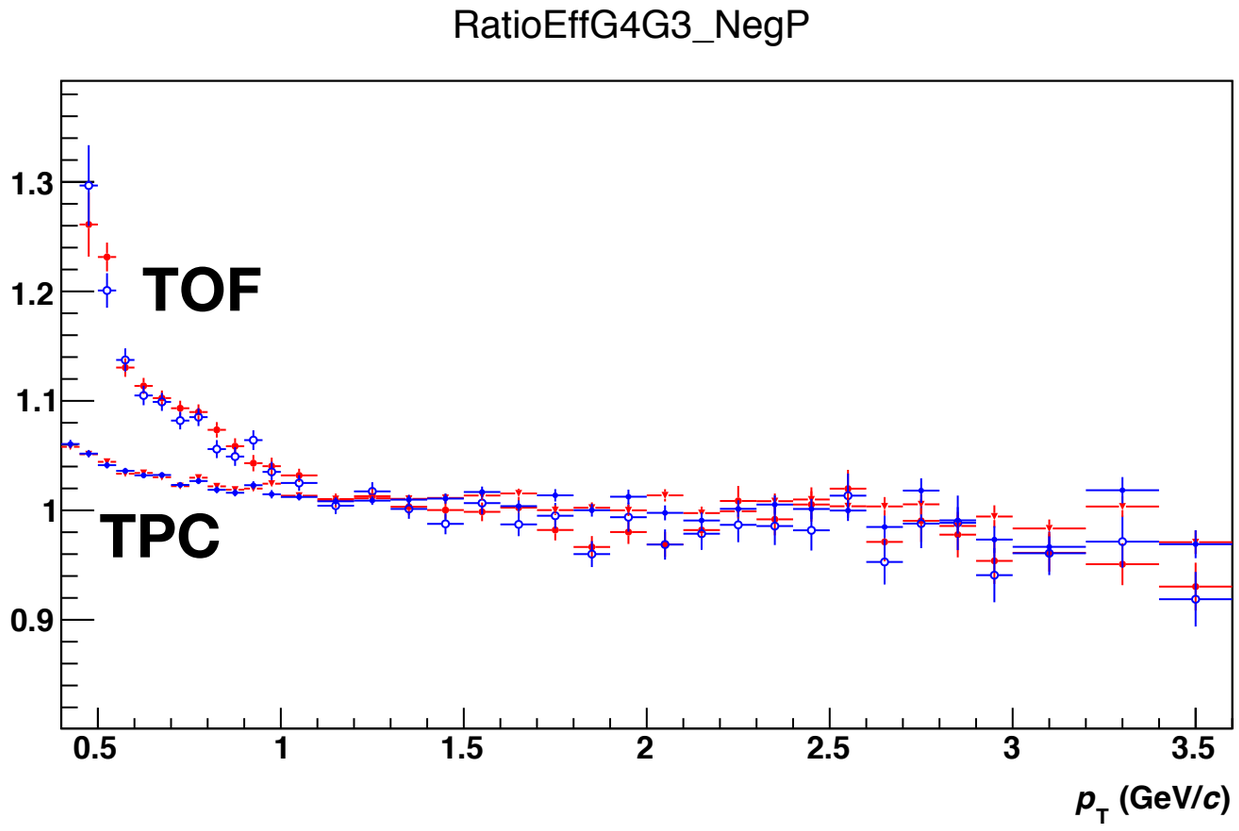
Questi sono gli spettri finali combinati: le nuove correzioni sulle efficienze del TOF comportano come aspettato un aumento delle efficienze di K e P e quindi una diminuzione dello spettro finale: l'effetto è mitigato dal fatto che negli spettri finali pos e neg sono sommati



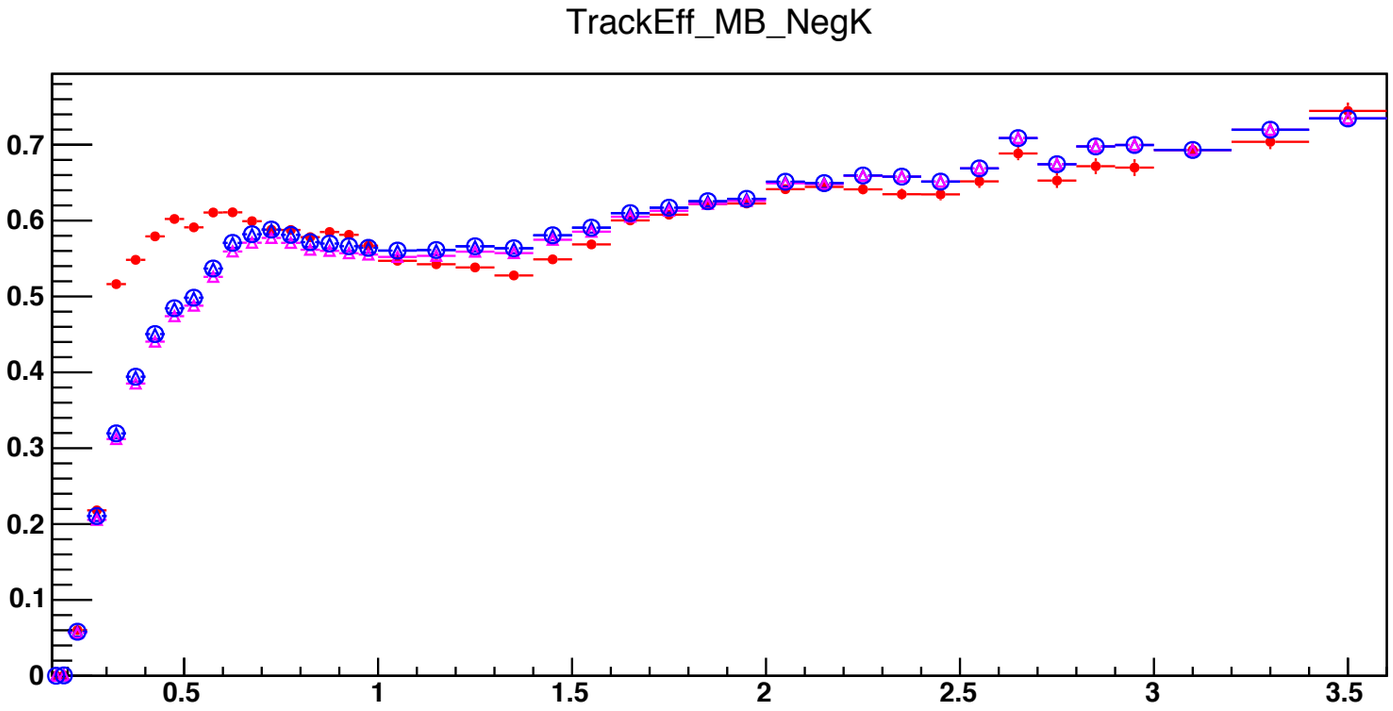


New Corr G4/G3 from pp at 5TeV

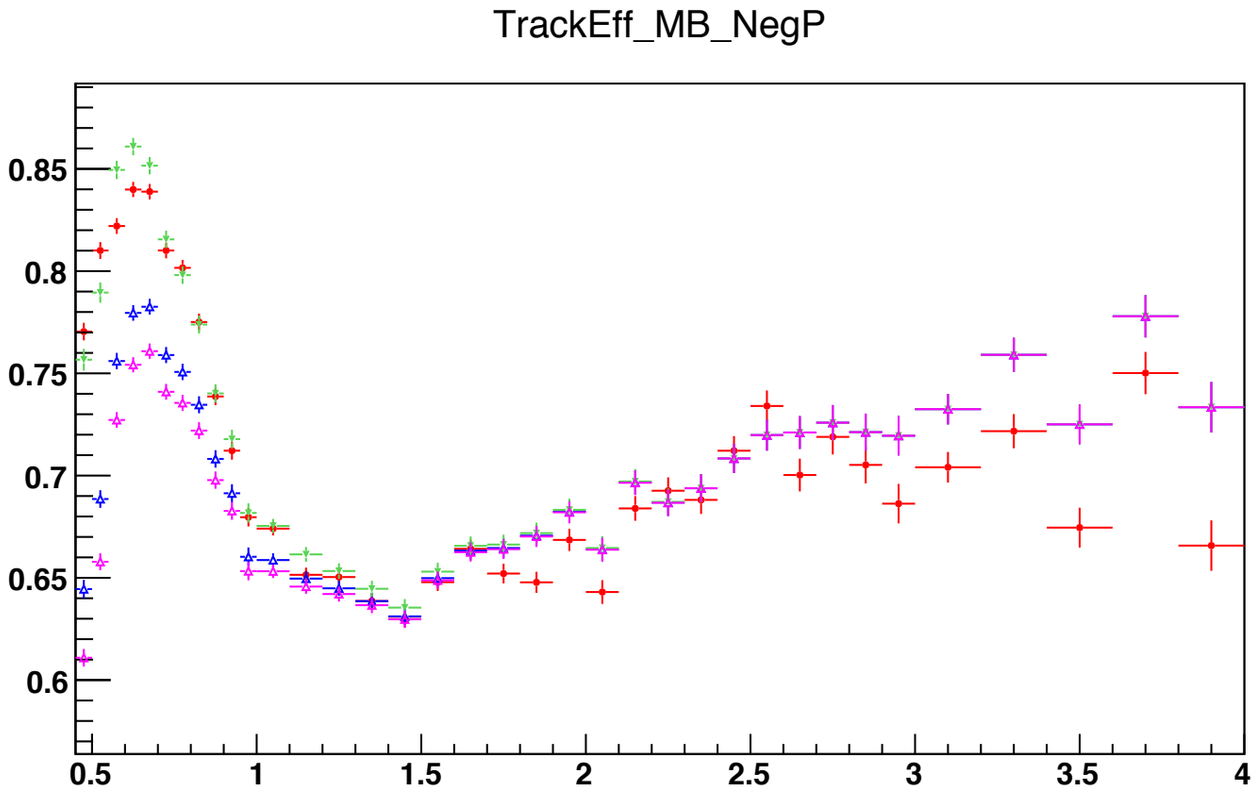




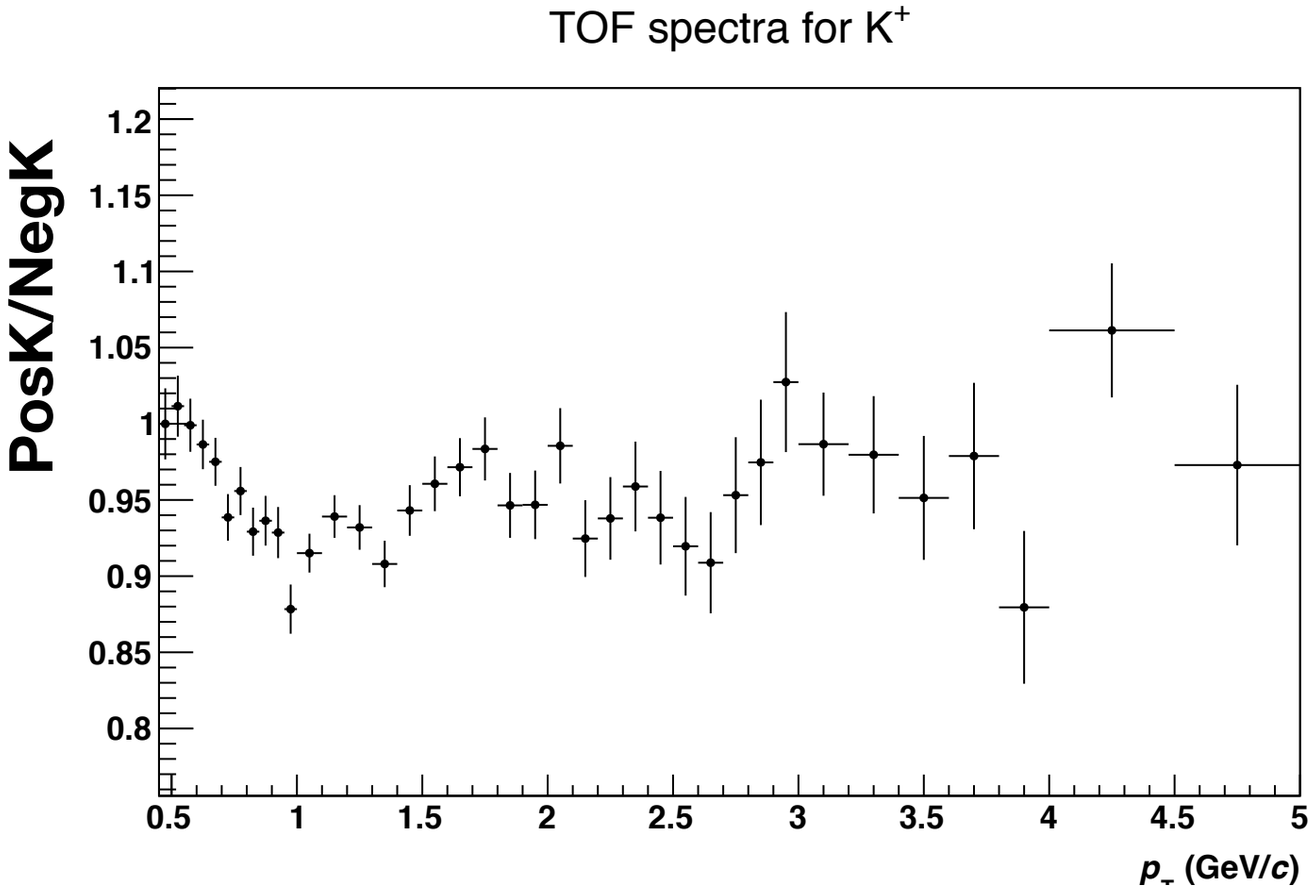
TOF efficiencies

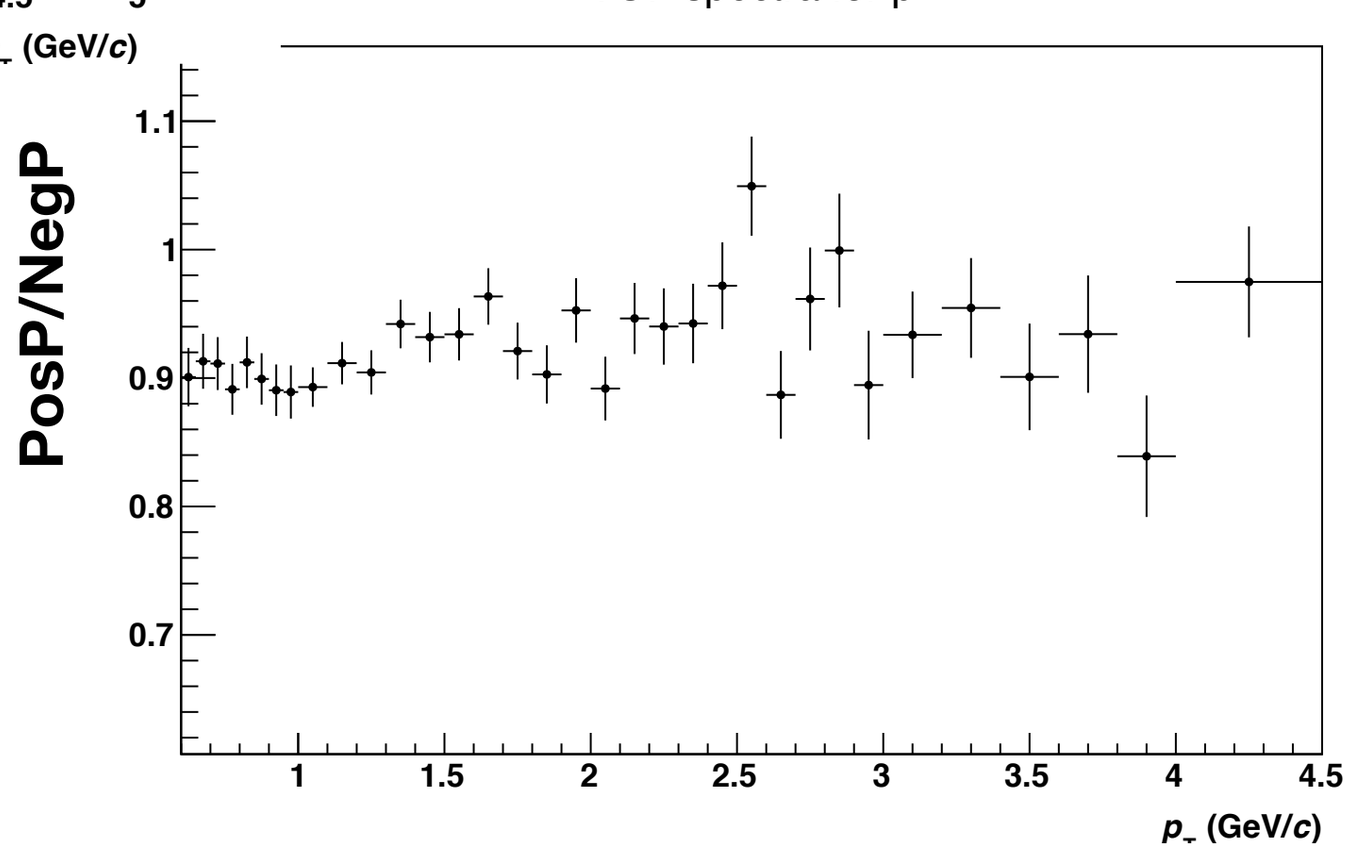


MyCorr
CorrLv1
CorrLv2
NoCorr

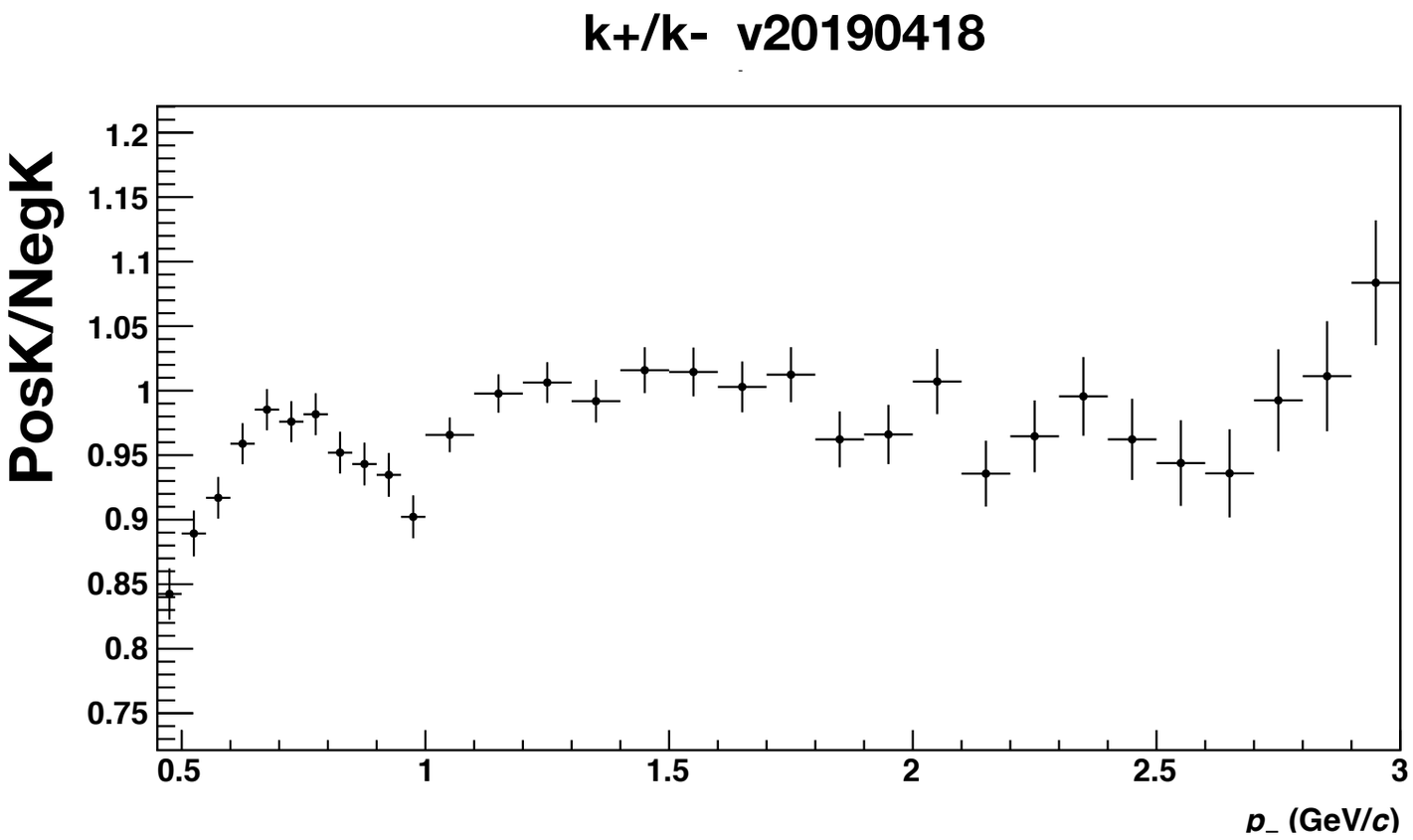


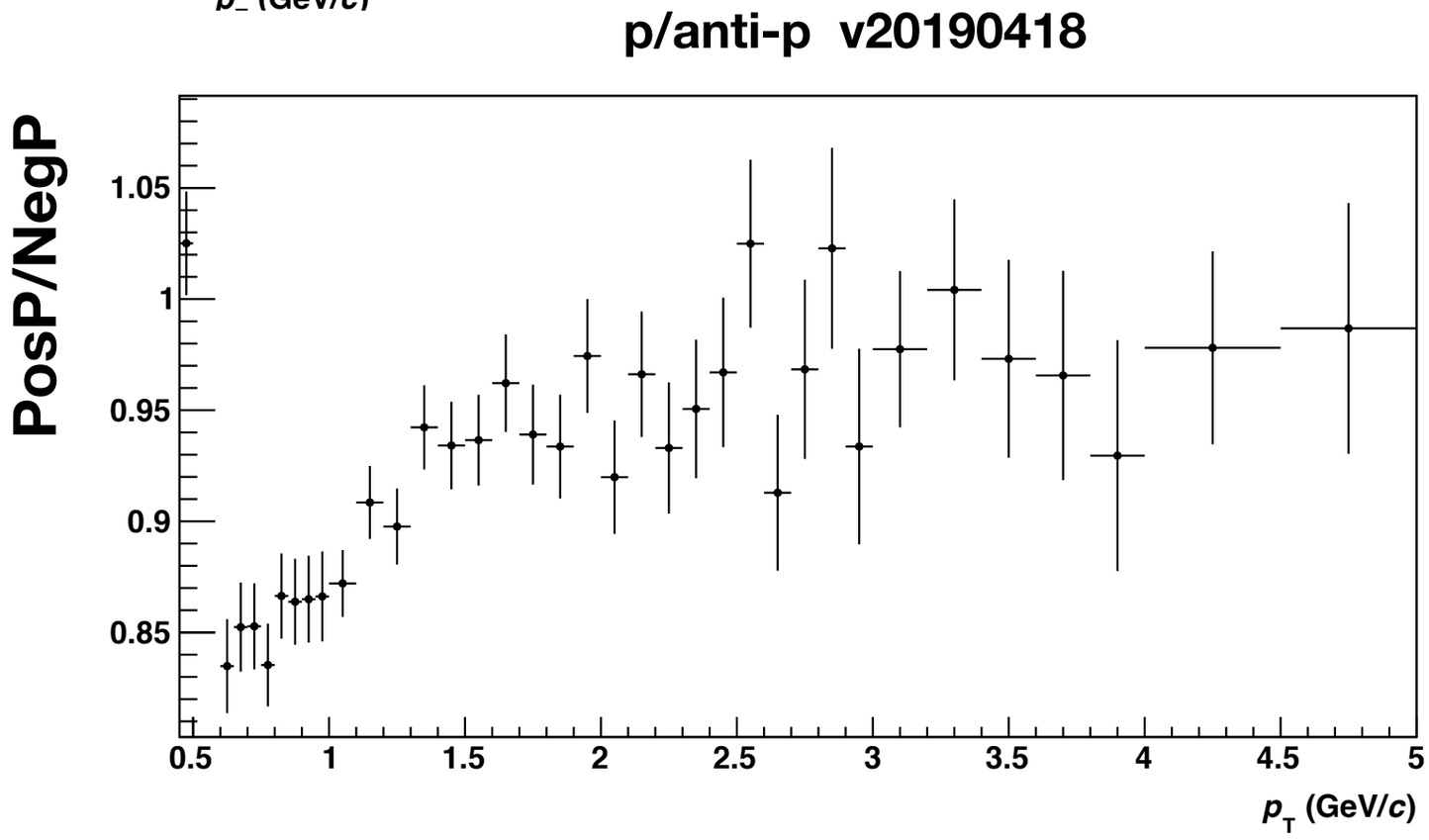
New Pos/Neg ratio after new corr



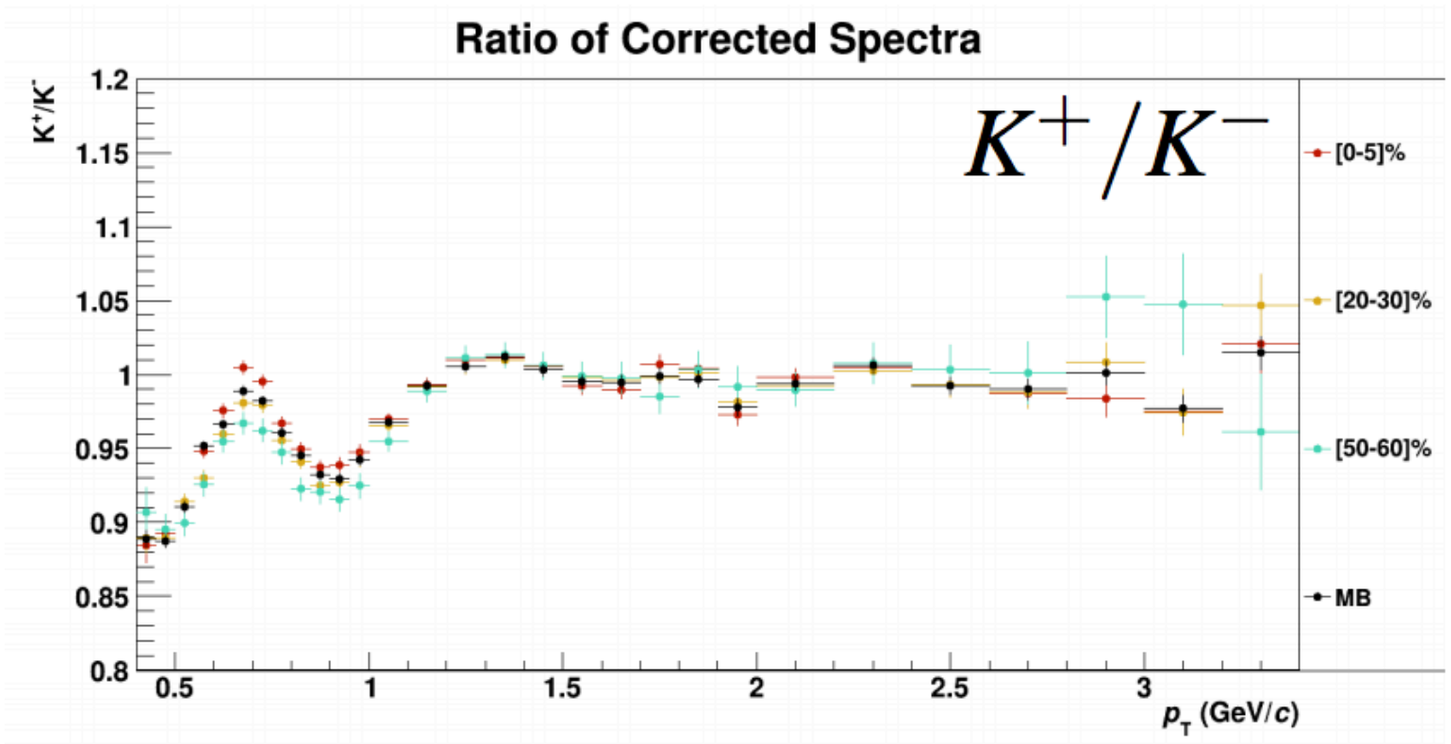


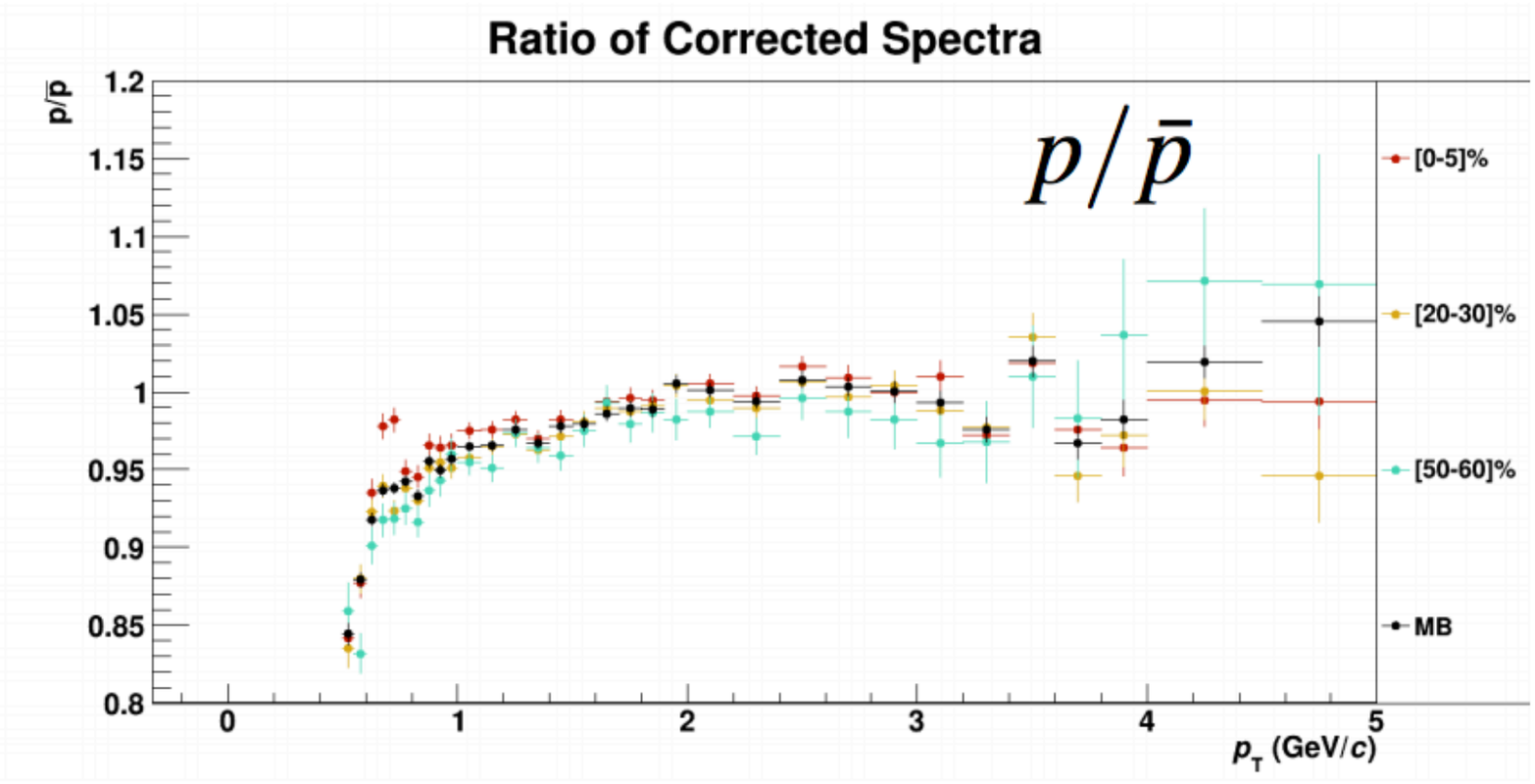
Old Pos/Neg ratio (pre new corr)



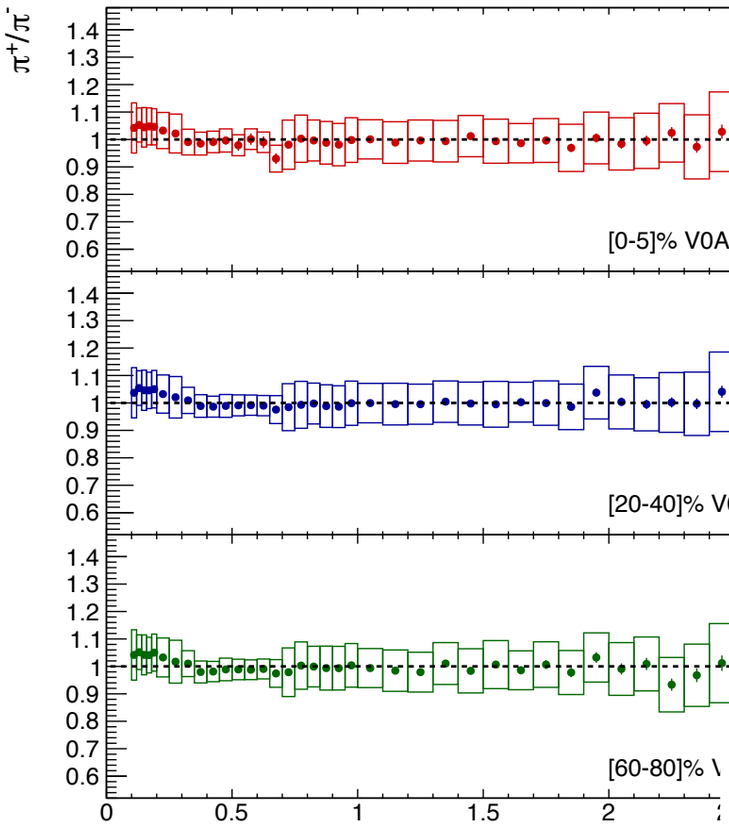


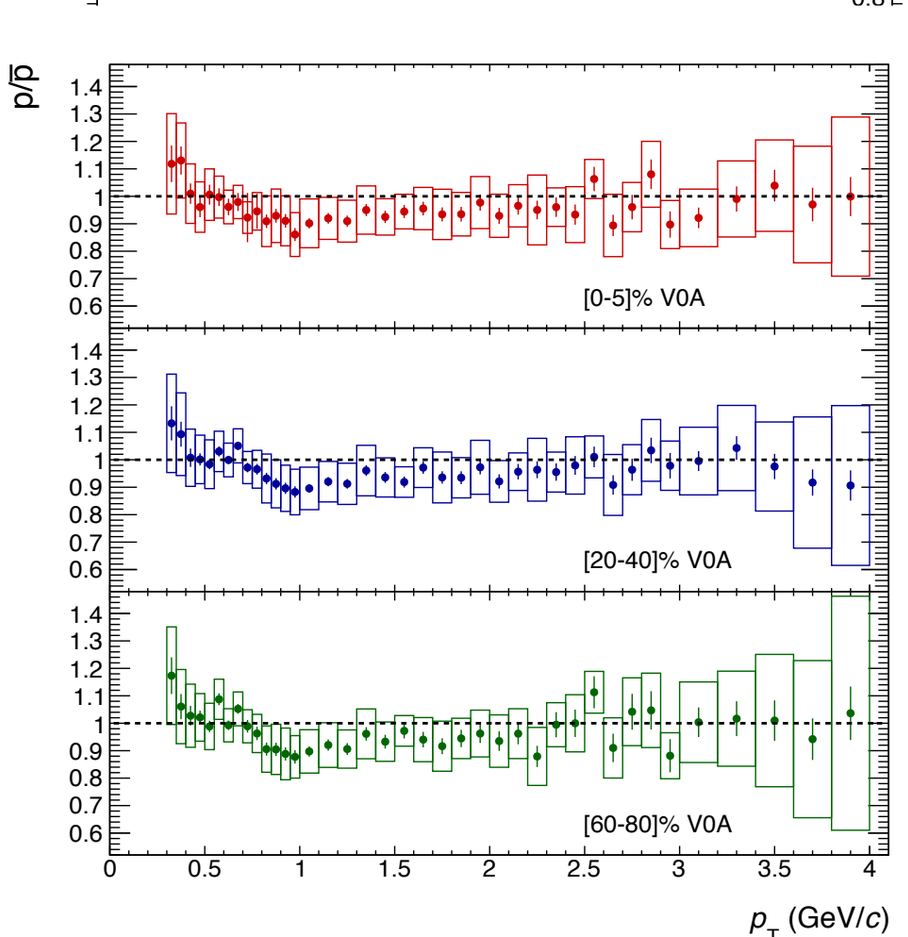
Old Pos/Neg ratio (pre new corr)

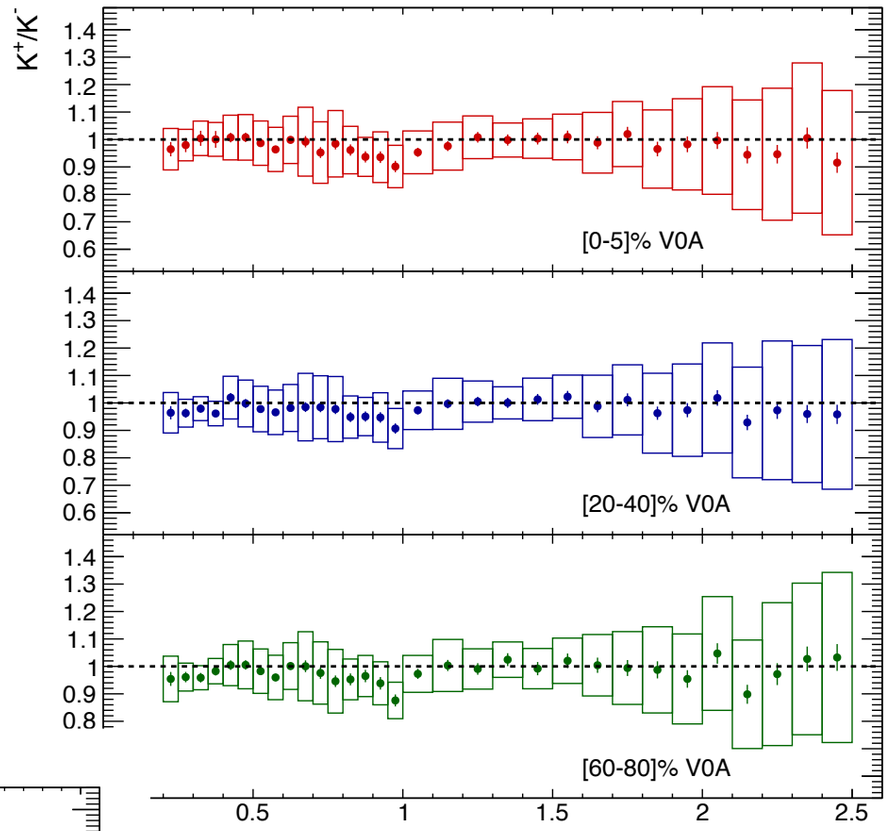




Combined Ratio Pos/Neg







Combined Ratio Pos/Neg