Track fitting efficiencies

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JINR, Dubna

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HardQCD:all = on

Cut
GetIsGood()

2
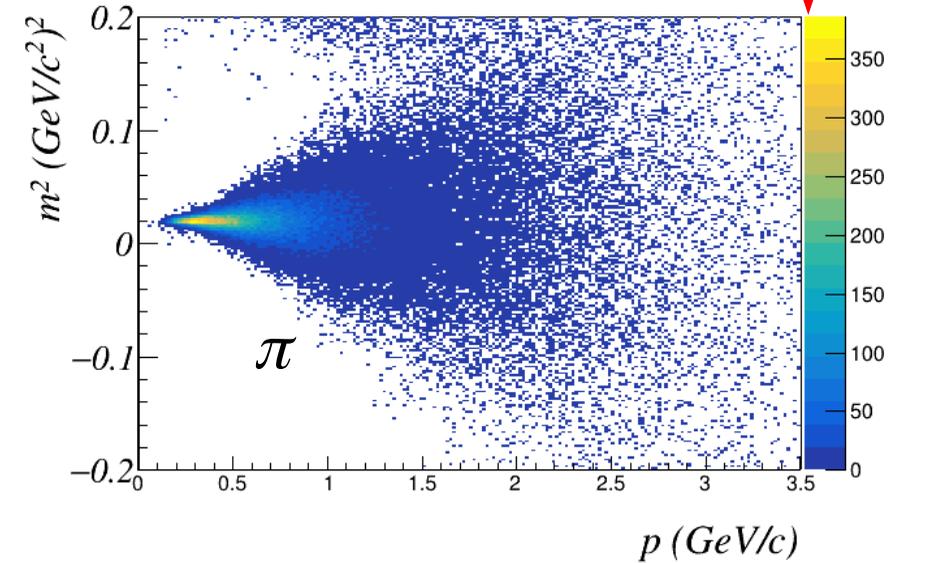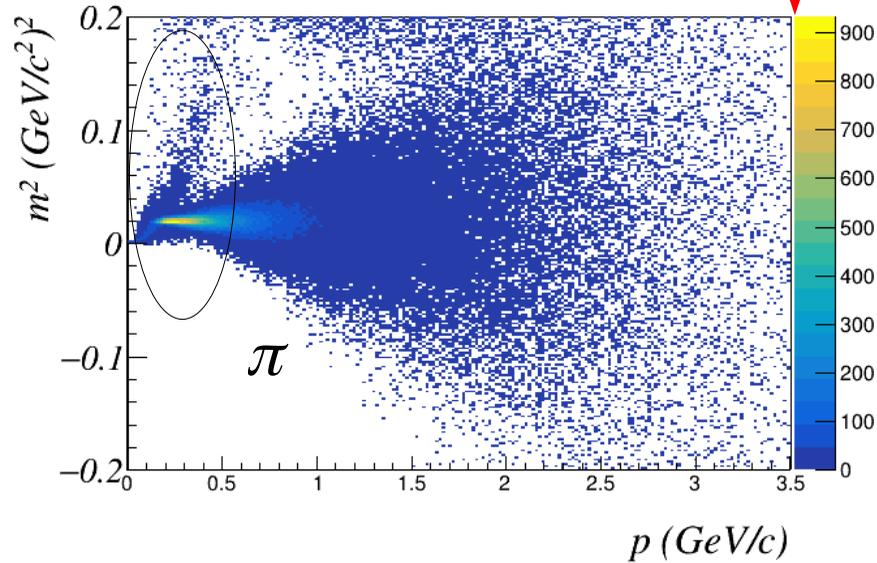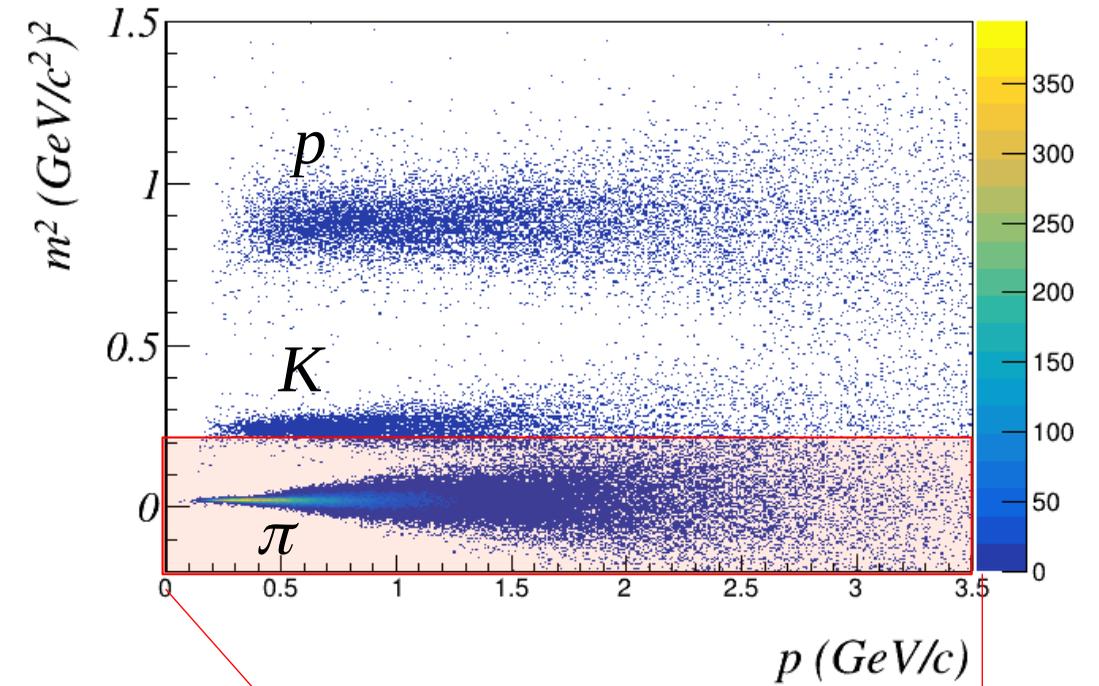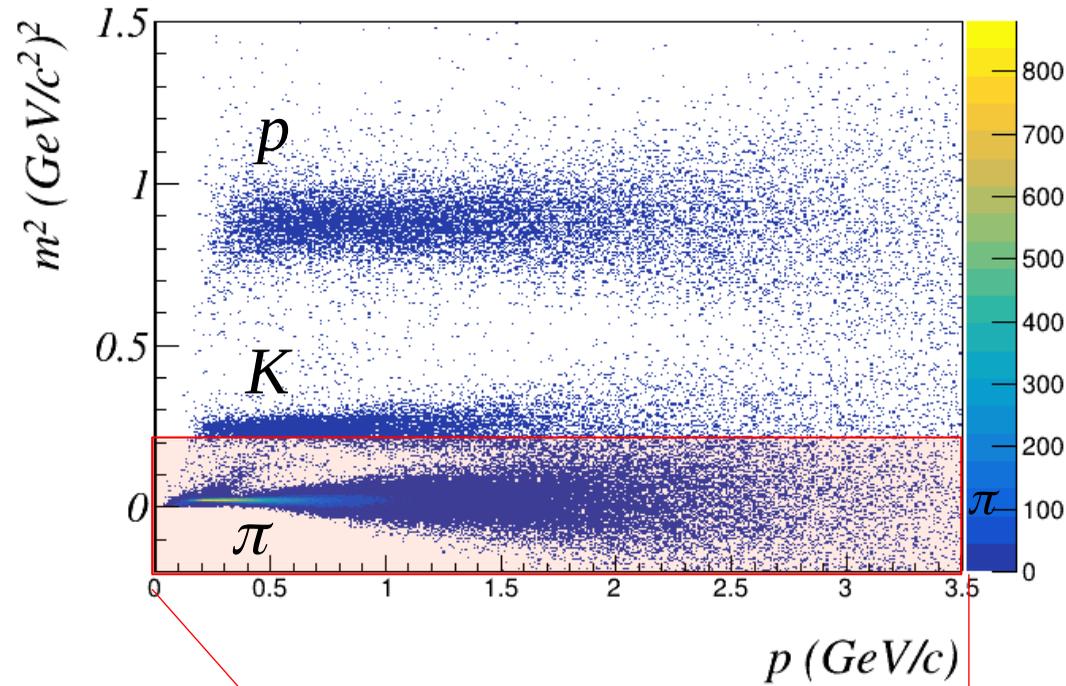
Track quality

```
SpdTrackFitPar *fitpars = mctrack->GetFitPars();

    fitpars->GetIsGood()
```

```cpp
//-------------------------------------------------
inline Bool_t SpdTrackFitPar::GetIsGood() const
{
    if (fErrorFlag != 0) return false;
    if (HasErrorMesg()) return false;
    //if (fNFailedHits > 0) return false;
    if (fConvergencyGF != 1) return false;
    return true;
}
```

```cpp
// Errors & fit GF-convergency
Int_t           fErrorFlag;      // see SpdTrackFitErrorFlags above
TString         fErrorMesg;      // error summary massage
Int_t           fNFailedHits;    // number of hits rejected in the fit process
Int_t           fConvergencyGF;  // 0 (not converged), -1 (partially converged), 1(fully converged)
```

3

Set-up

Magnetic field

$\otimes$

STRAW

VD

$p_{rc,\,last\,point}$

$p_{rc,\,first\,point}$

$p_{rc,\,final\,point}$

$$\pi^+,K^+,p,\mu^-,e^-$$

$p_{min}=0.1\,GeV \quad\quad \theta_{min}=10 \quad\quad\quad \phi_{min}=0$

$p_{max}=1.5\,GeV \quad\quad \theta_{max}=170 \quad\quad\quad \phi_{max}=360$

$p_{step}=0.1\,GeV \quad\quad \theta_{step}=10 \quad\quad\quad \phi_{step}=10$
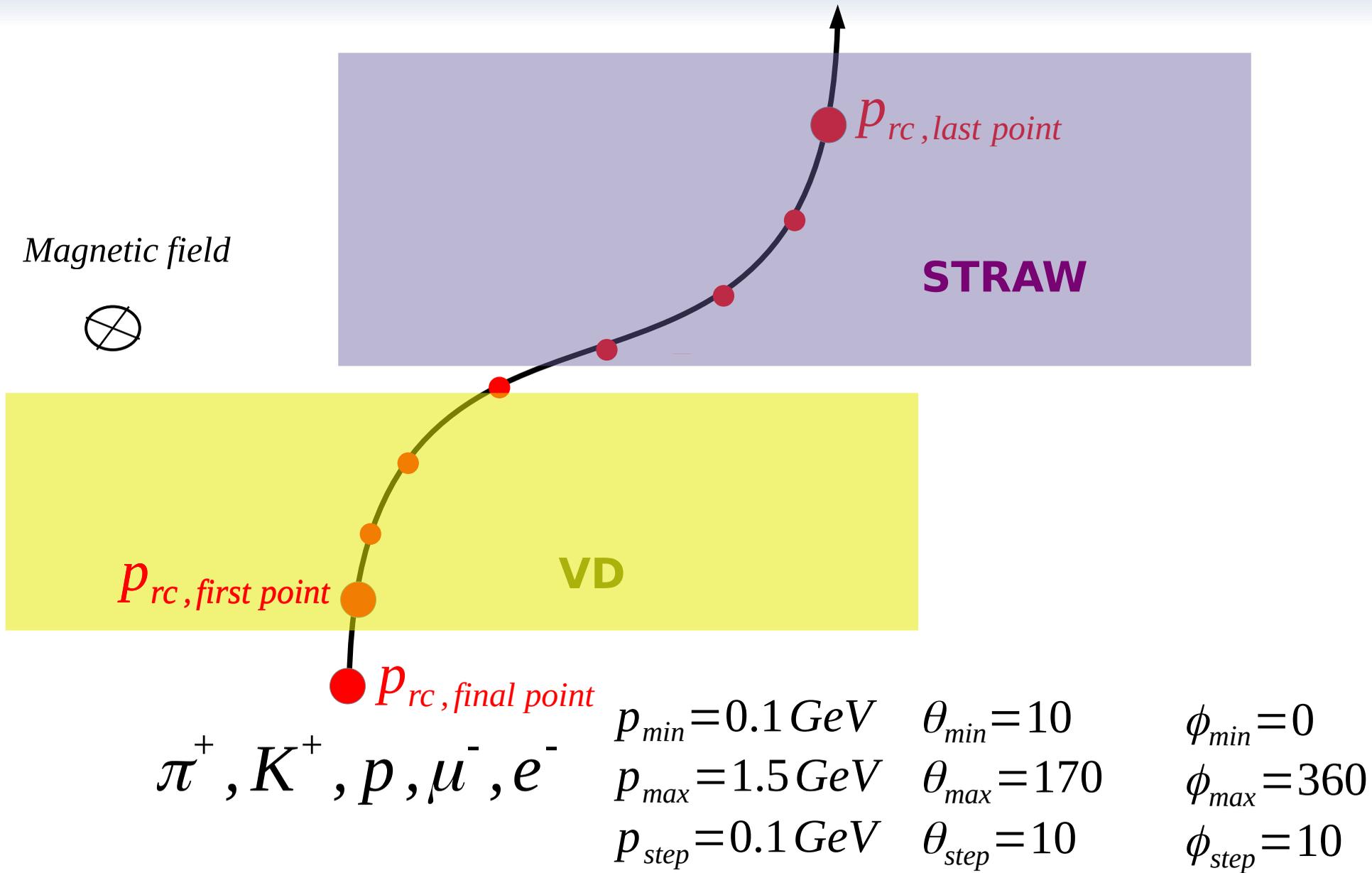
RecoEventFull

```
SpdMCTracksFinder* track_finder = new SpdMCTracksFinder();

//track_finder->SaveTracks(false);  // default: true

    SpdTrackFitterGF* track_fitter = track_finder->Fitter();

    //track_fitter->SetFitterMaxTrials(2); // default: 2
    //track_fitter->SetStartSeedMethod(1); // (0,1), default: 1

    //track_fitter->StoreImPoints(true);     // default: false
    //track_fitter->StoreImMomentum(true);   // default: true
    //track_fitter->StoreImPosition(true);   // default: false
    //track_fitter->StoreImCovariance(true); // default: false

    track_fitter->SetVerboseLevel(1);

track_finder->SetVerboseLevel(1);

Run->AddTask(track_finder);

 //----------------------------------------------------------//
 // [MC-VERTEX FITTER]
 // Input: mc-event, mc-particles, mc-vertices,
 //        mc-tracks + track-fit-parameters
 // Output: vertices-fit-parameters -> mc-vertices

SpdMCVerticesFitter* mcvtxs_fitter = new SpdMCVerticesFitter();

mcvtxs_fitter->SetVerboseLevel(1);

Run->AddTask(mcvtxs_fitter);

 //----------------------------------------------------------//
```

5

Convergency, HasErrorMesg, ErrorFlag

```
Int_t        fConvergencyGF;    // 0 (not converged), -1 (partially converged), 1(fully converged)
```
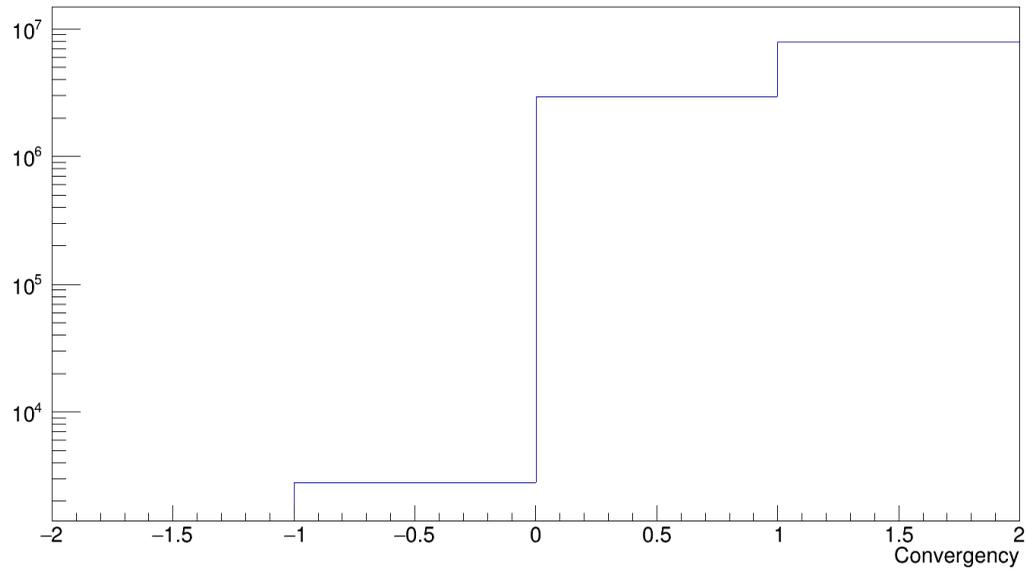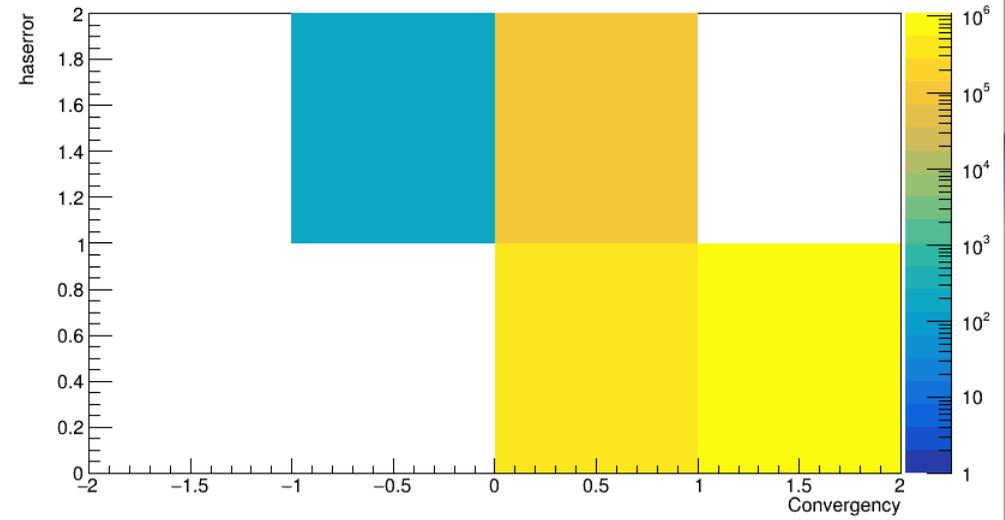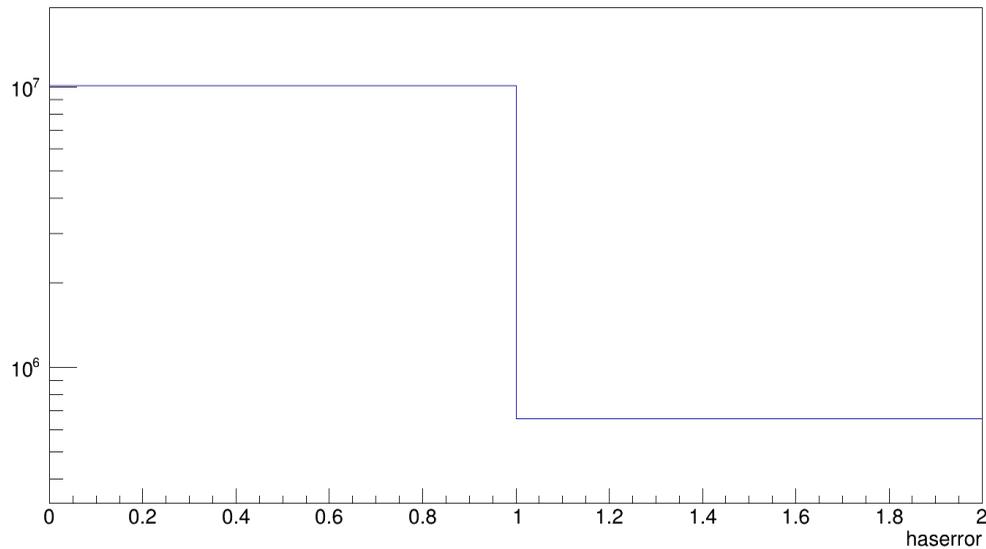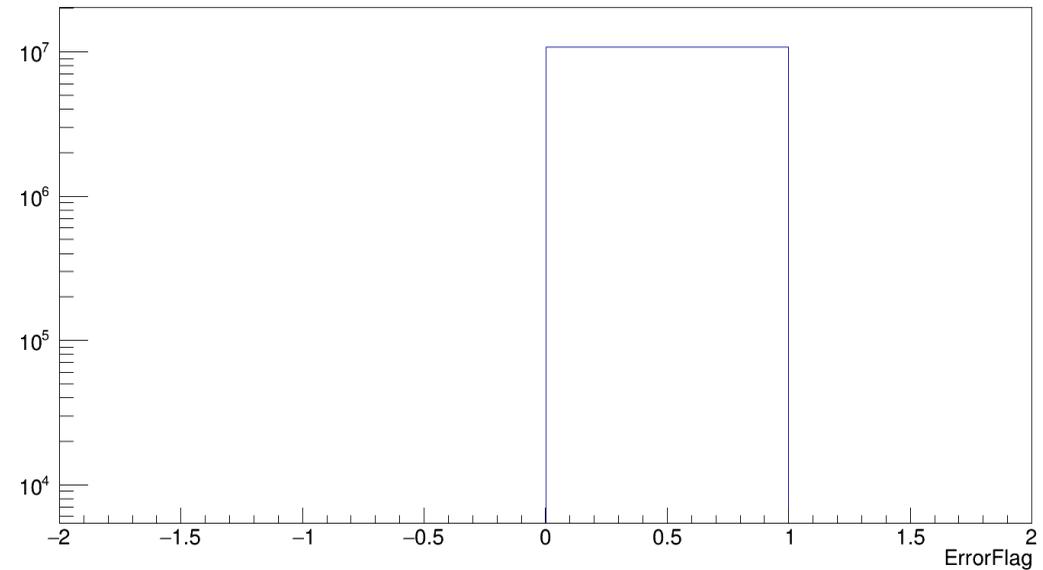
Cut flow

Momentum range 0.1 – 1.5 GeV

|	electron	muon	pion	kaon	proton
HasErrorMesg	0.91	0.94	0.94	0.93	0.94
ConvergencyGF	0.72	0.74	0.74	0.72	0.66
GetIsGood	0.72	.074	0.74	0.72	0.66
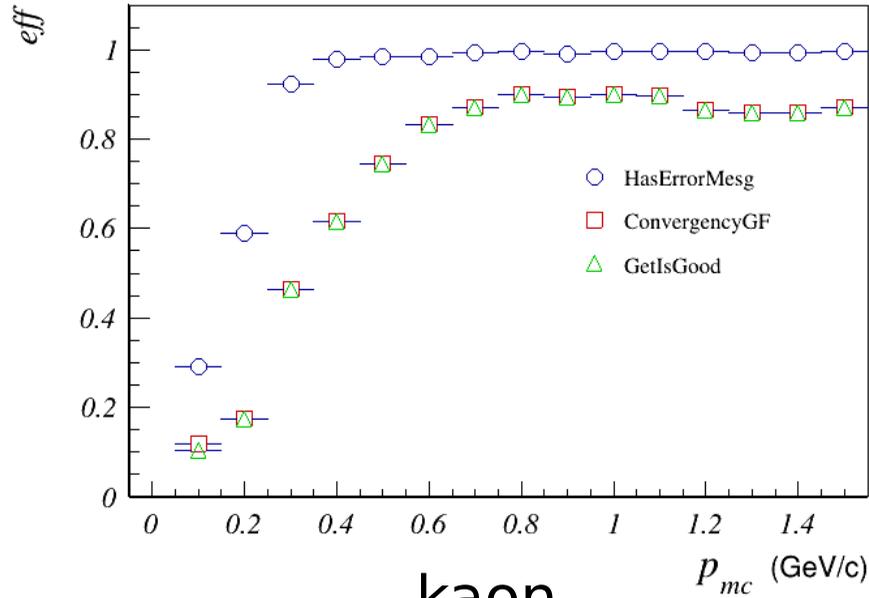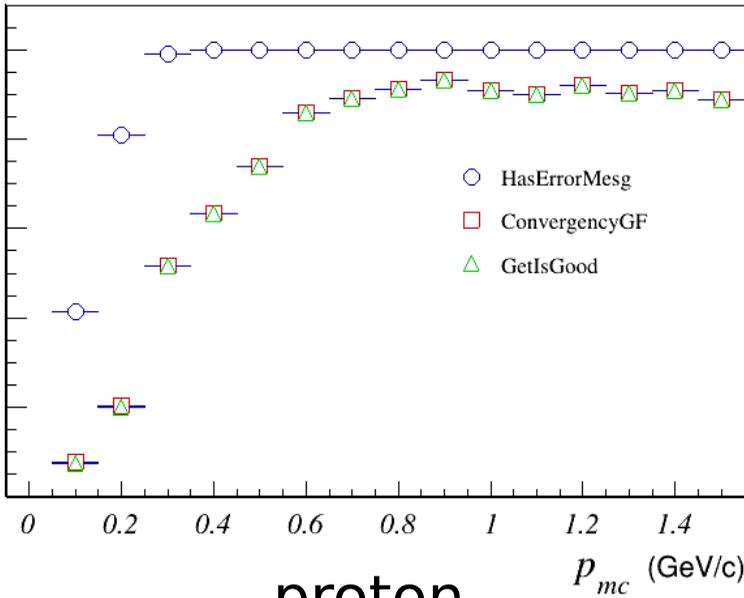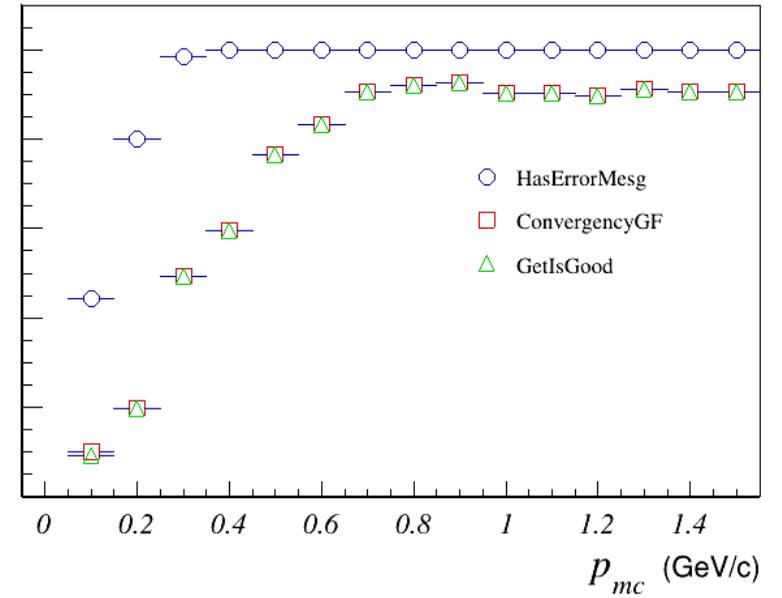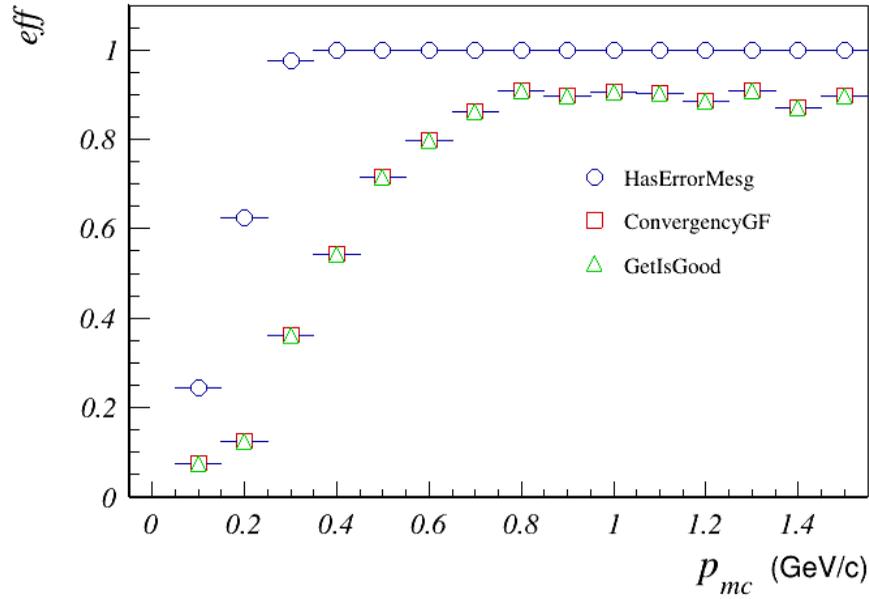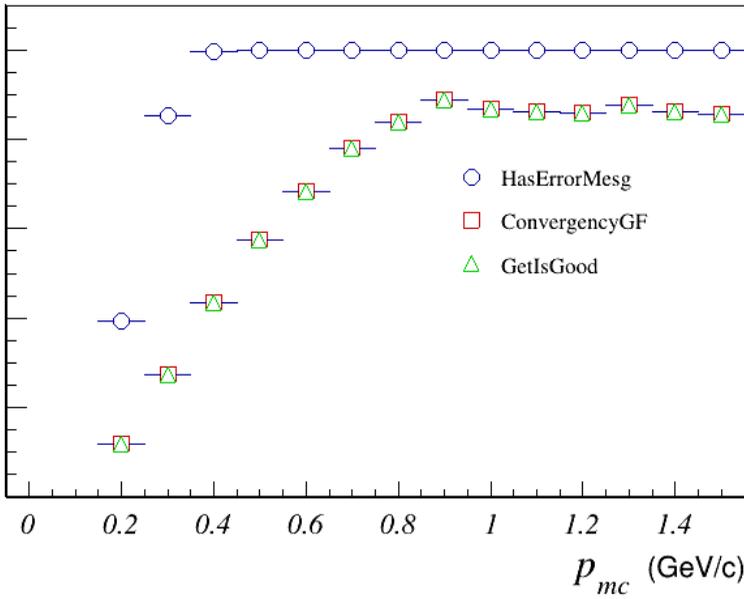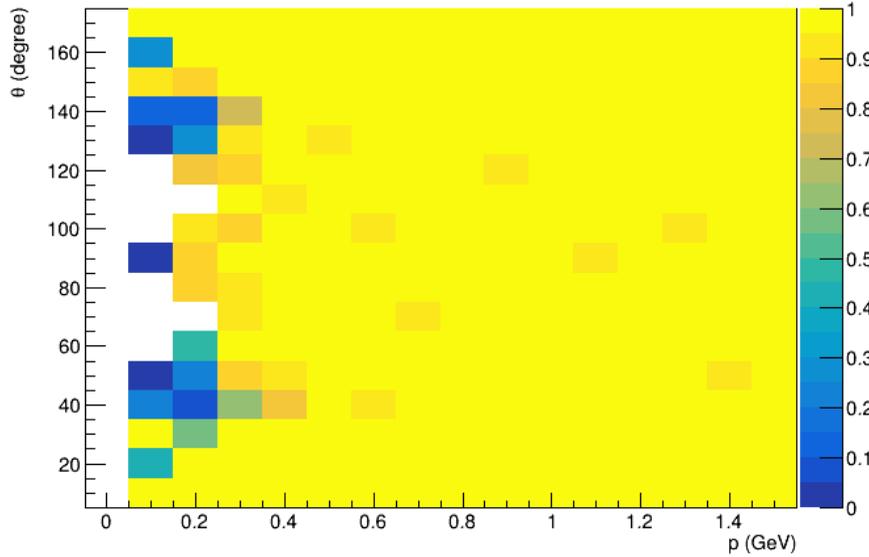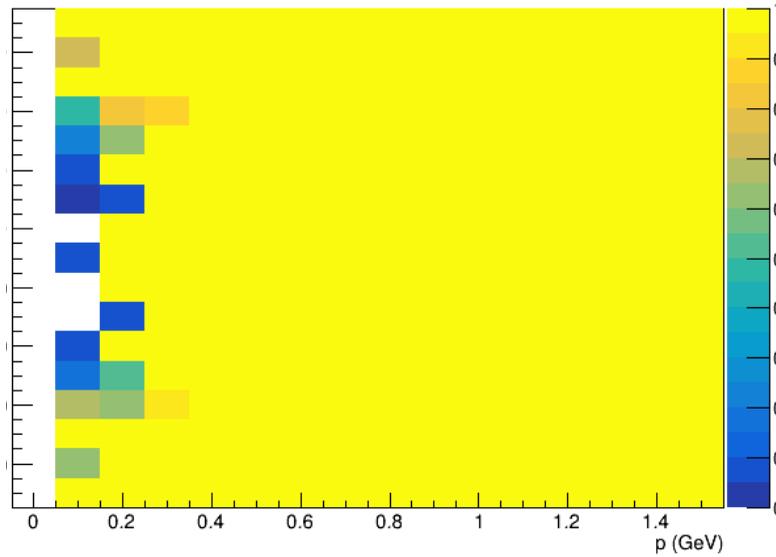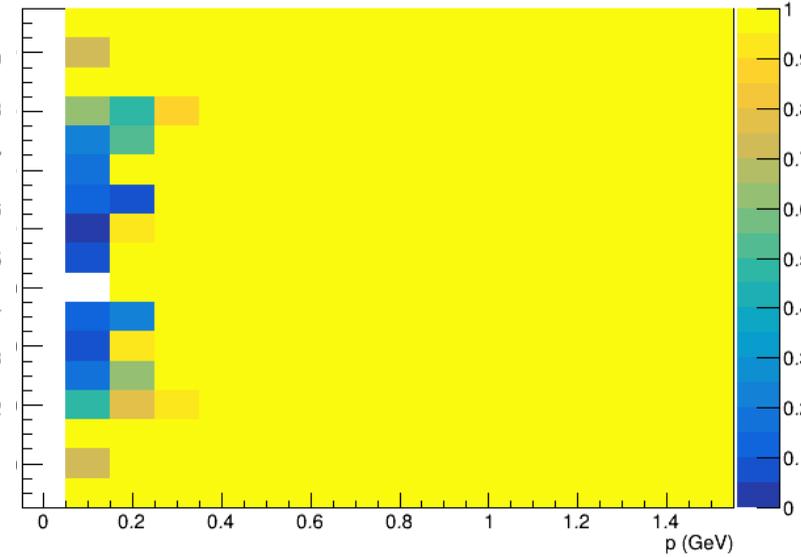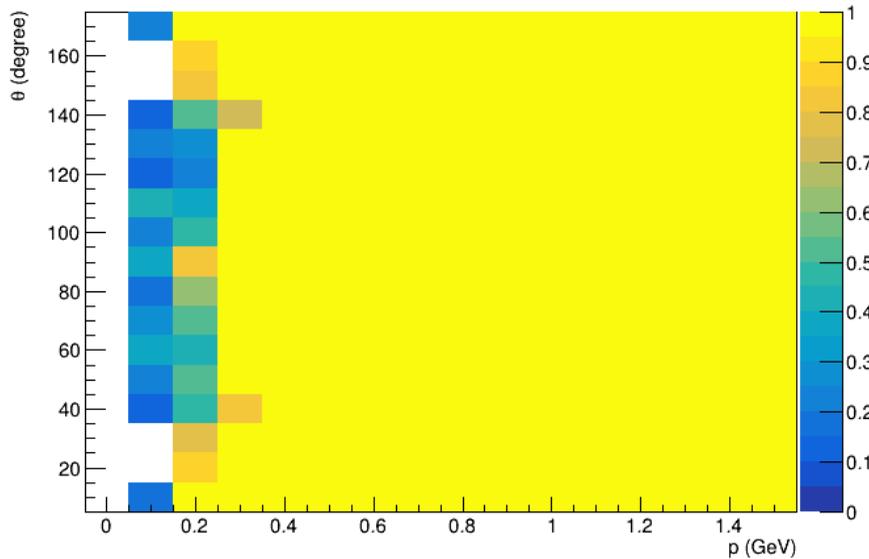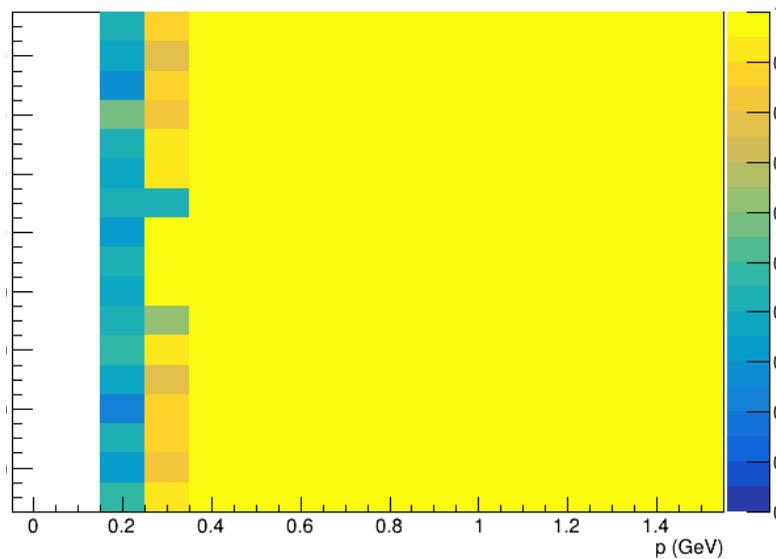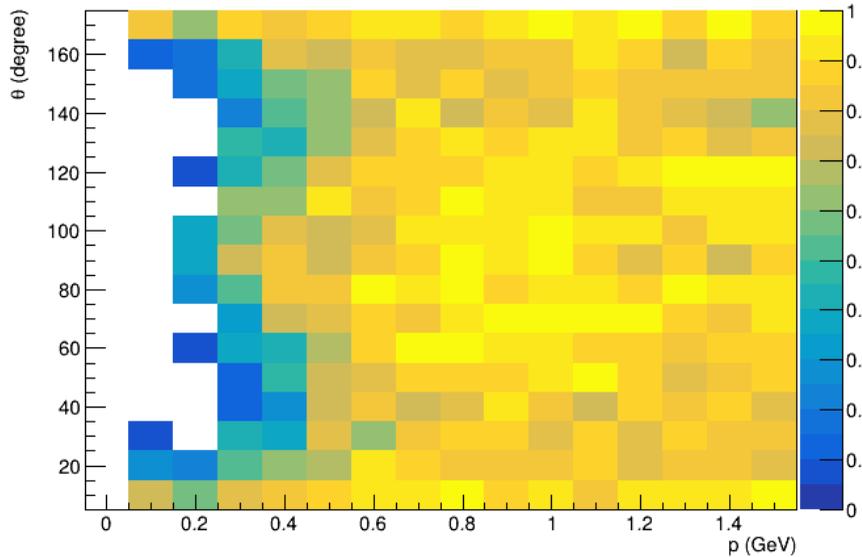
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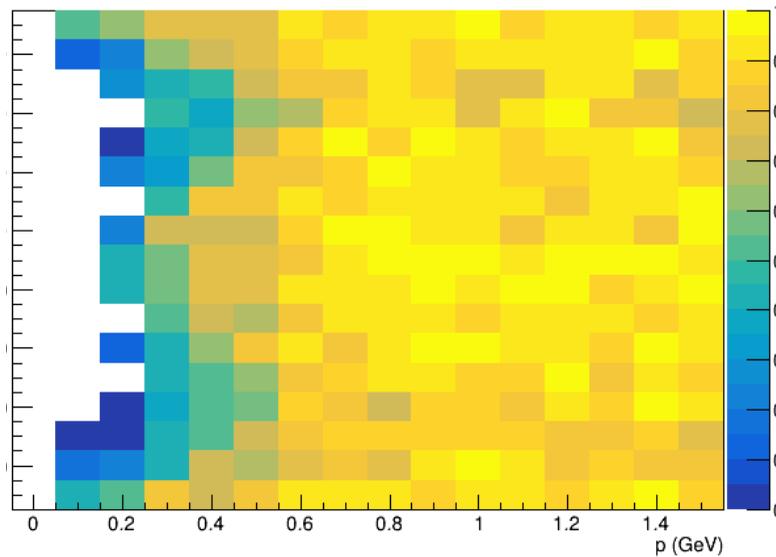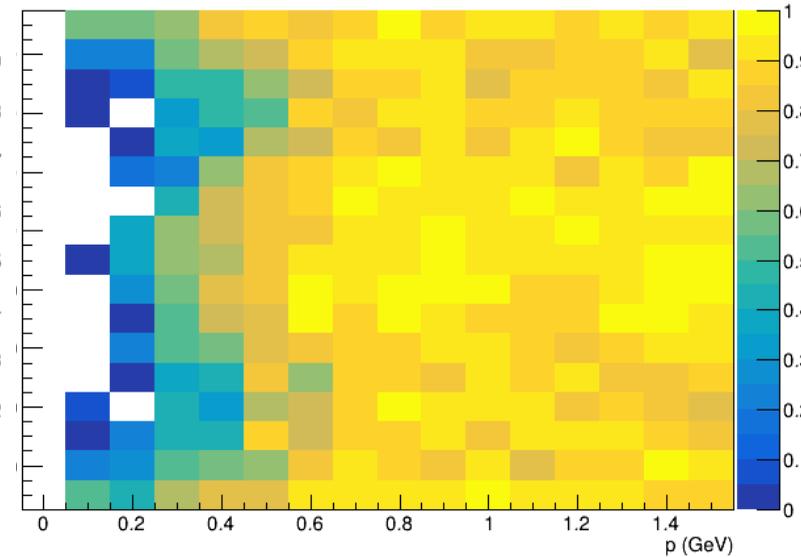
muon
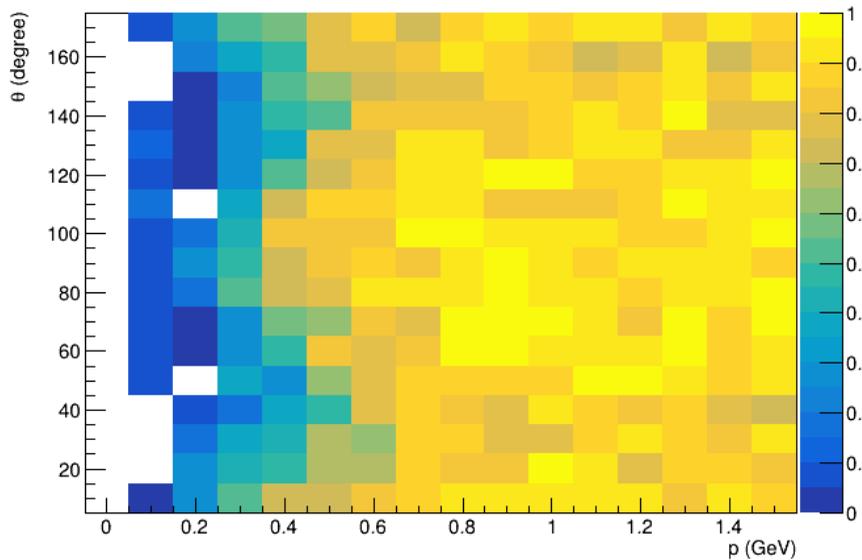
pion

kaon
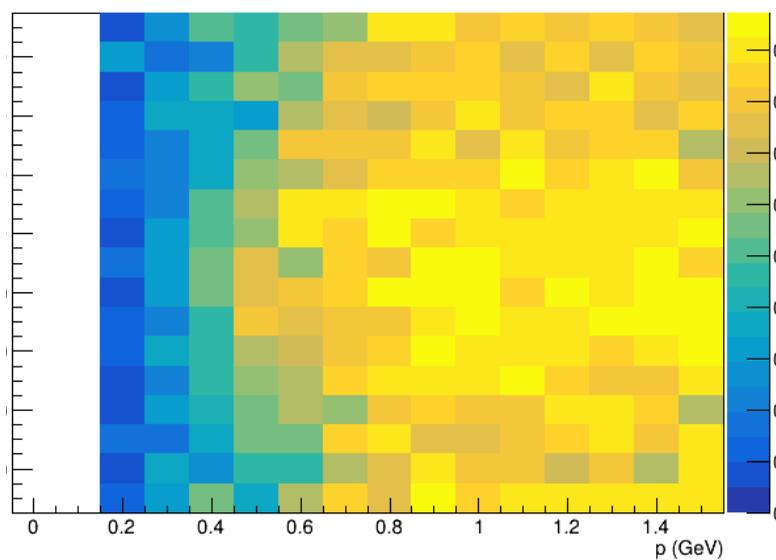
proton

electron

muon

pion

kaon

proton
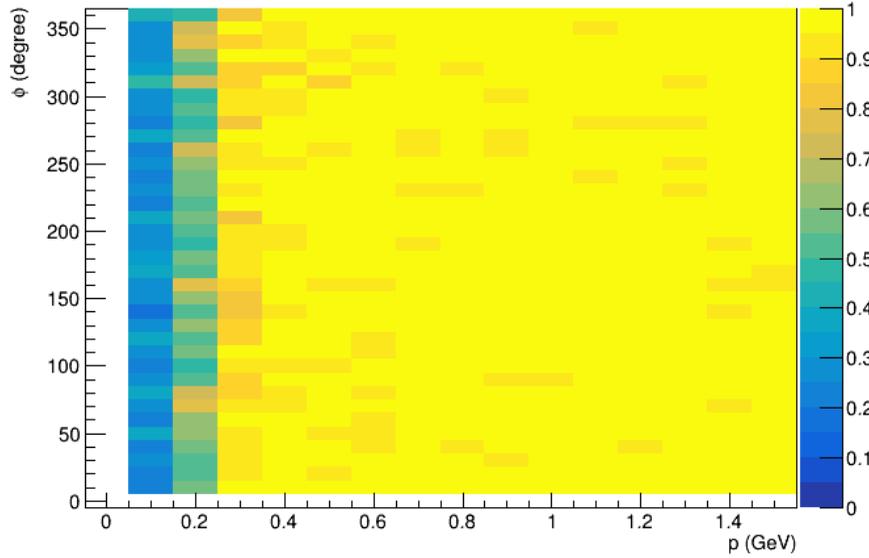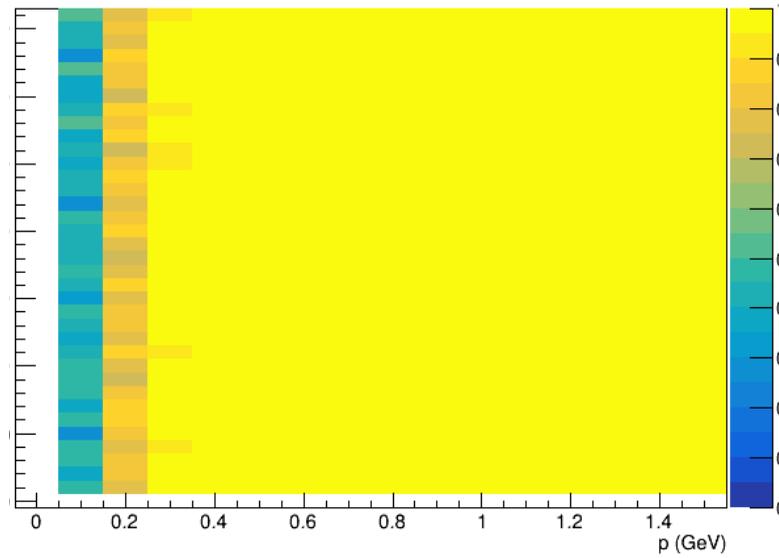
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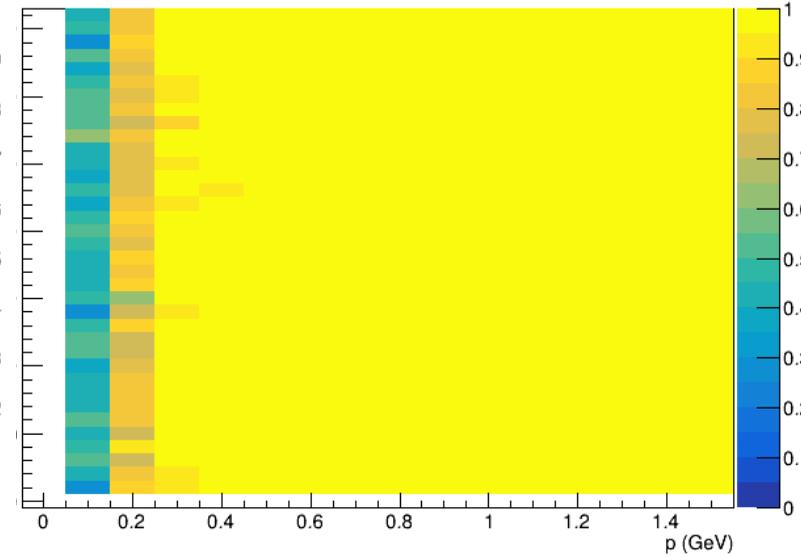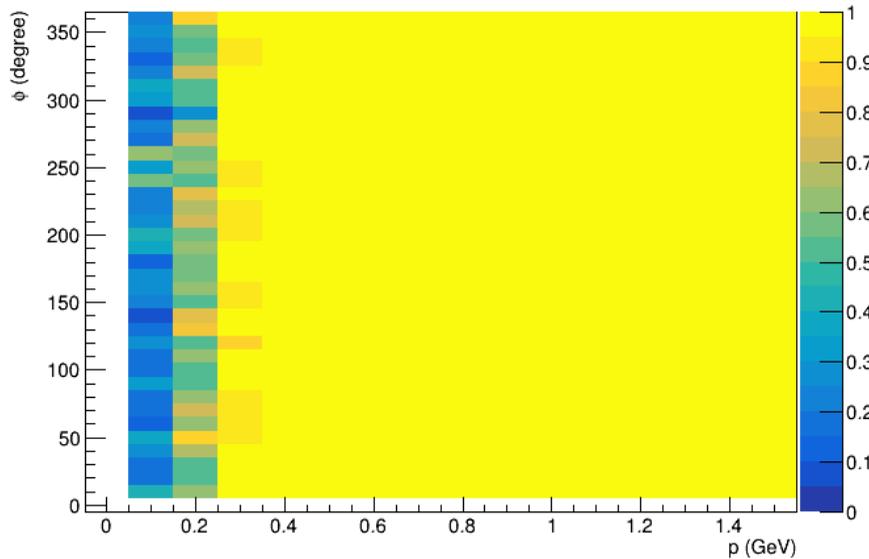
muon

pion
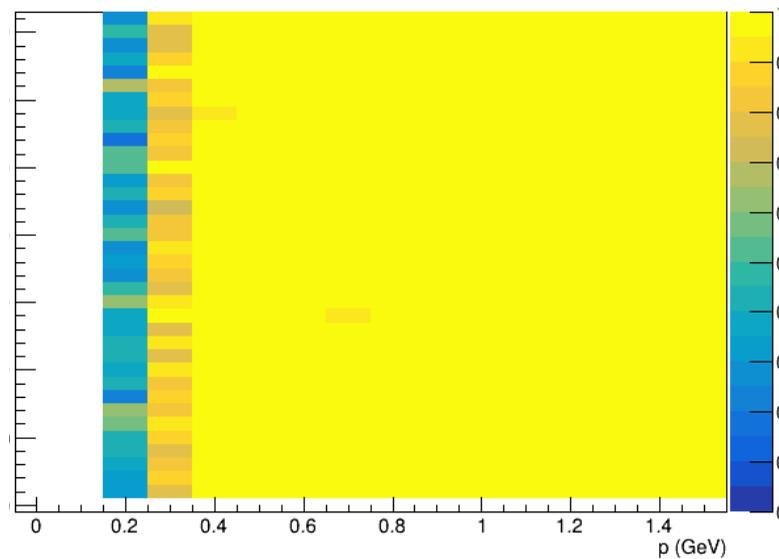
kaon

proton

electron

muon

pion

kaon
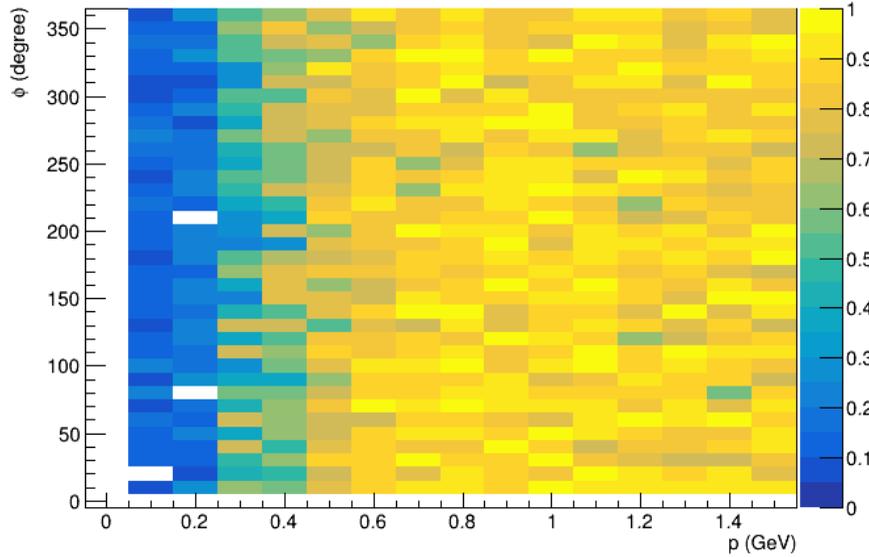
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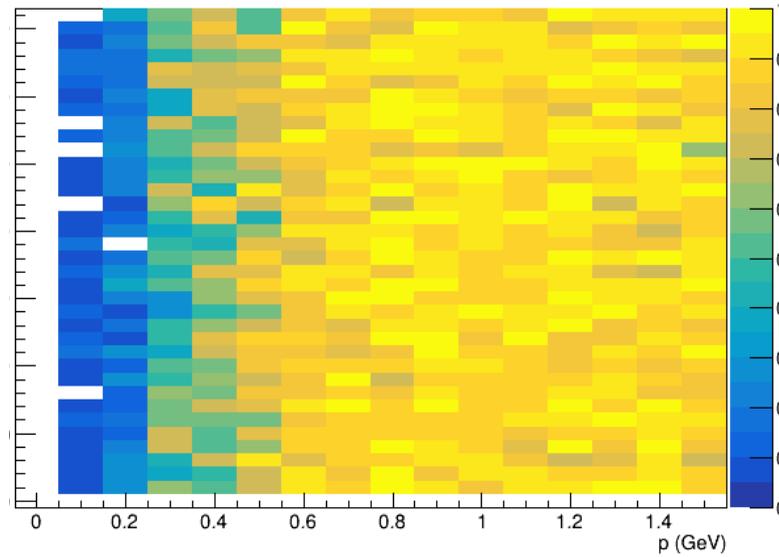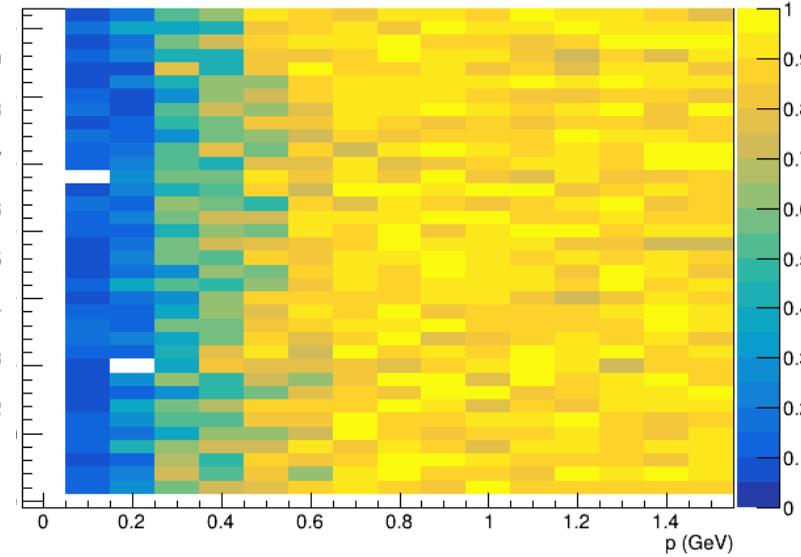
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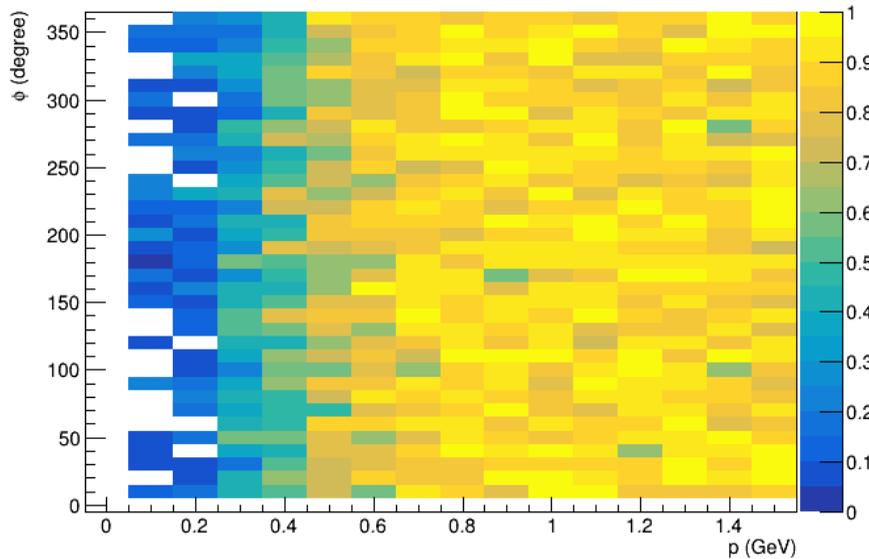
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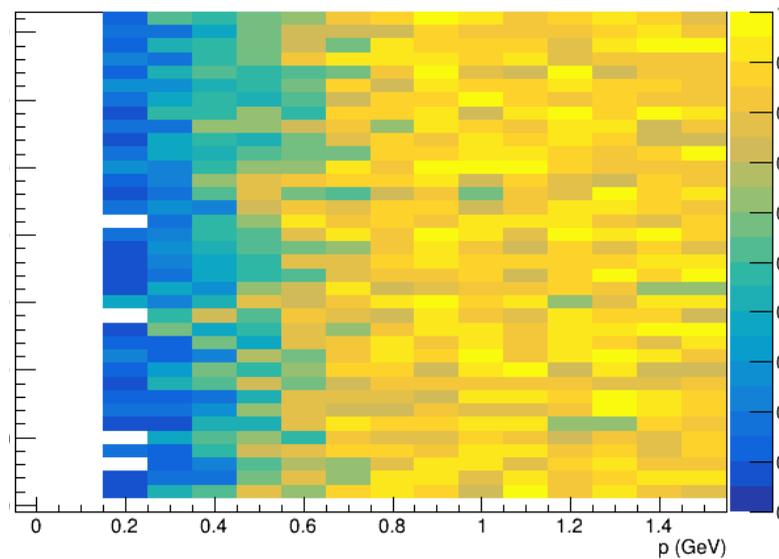
pion

kaon

proton

# Residual: mean, p_{mc} vs $(p_{rc,final} - p_{mc})/p_{mc}$

Residual: sigma, p_{mc} vs $(p_{rc,final} - p_{mc})/p_{mc}$