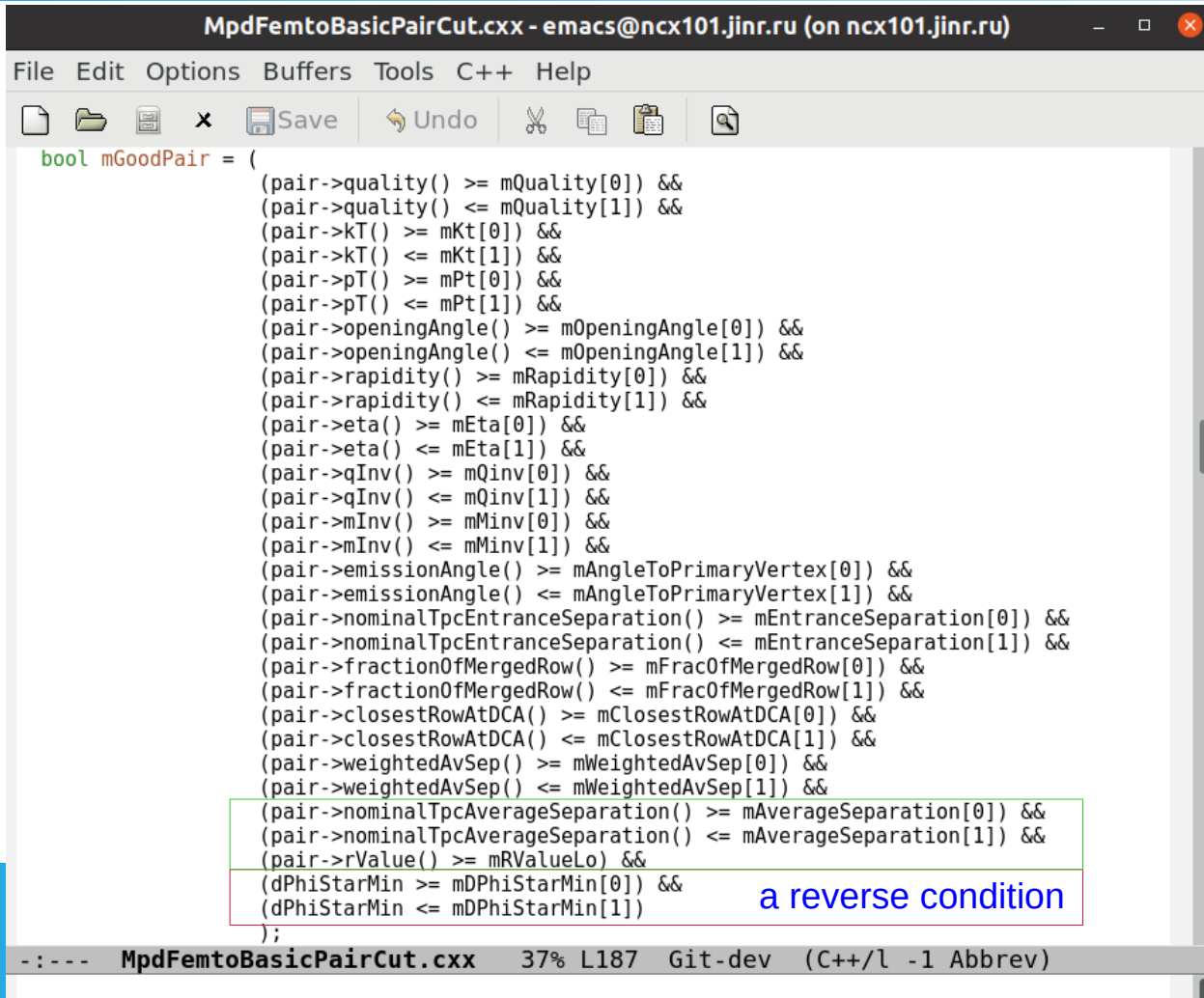


Two Track Cuts with miniDST

hbtMiniDst.C main cuts

```
// Create and set track cut for pion selection using TPC+TOF method  
MpdFemtoBasicTrackCut *trackCut = new MpdFemtoBasicTrackCut();  
trackCut->selectPrimary( true ); // analyse only primary tracks  
trackCut->setCharge( 1 );  
trackCut->setNHits( 15, 60 );  
trackCut->setEta( -1., 1. );  
trackCut->setPt( 0.15, 1.45 );  
trackCut->setP( 0.15, 1.45 );  
trackCut->setDCA( 0., 3. );  
trackCut->setDetectorSelection( 2 );  
trackCut->setTnTNSigmaPion( -2., 2. );  
trackCut->setMassSqr( -0.05, 0.08 );  
trackCut->setHbtPid( MpdFemtoBasicTrackCut::HbtPID::Pion );  
trackCut->setMass(M_PION_PLUS); // from MpdFemtoMaker/phys_constants.h
```

MpdFemtoMakerUser/MpdFemtoBasicPairCut

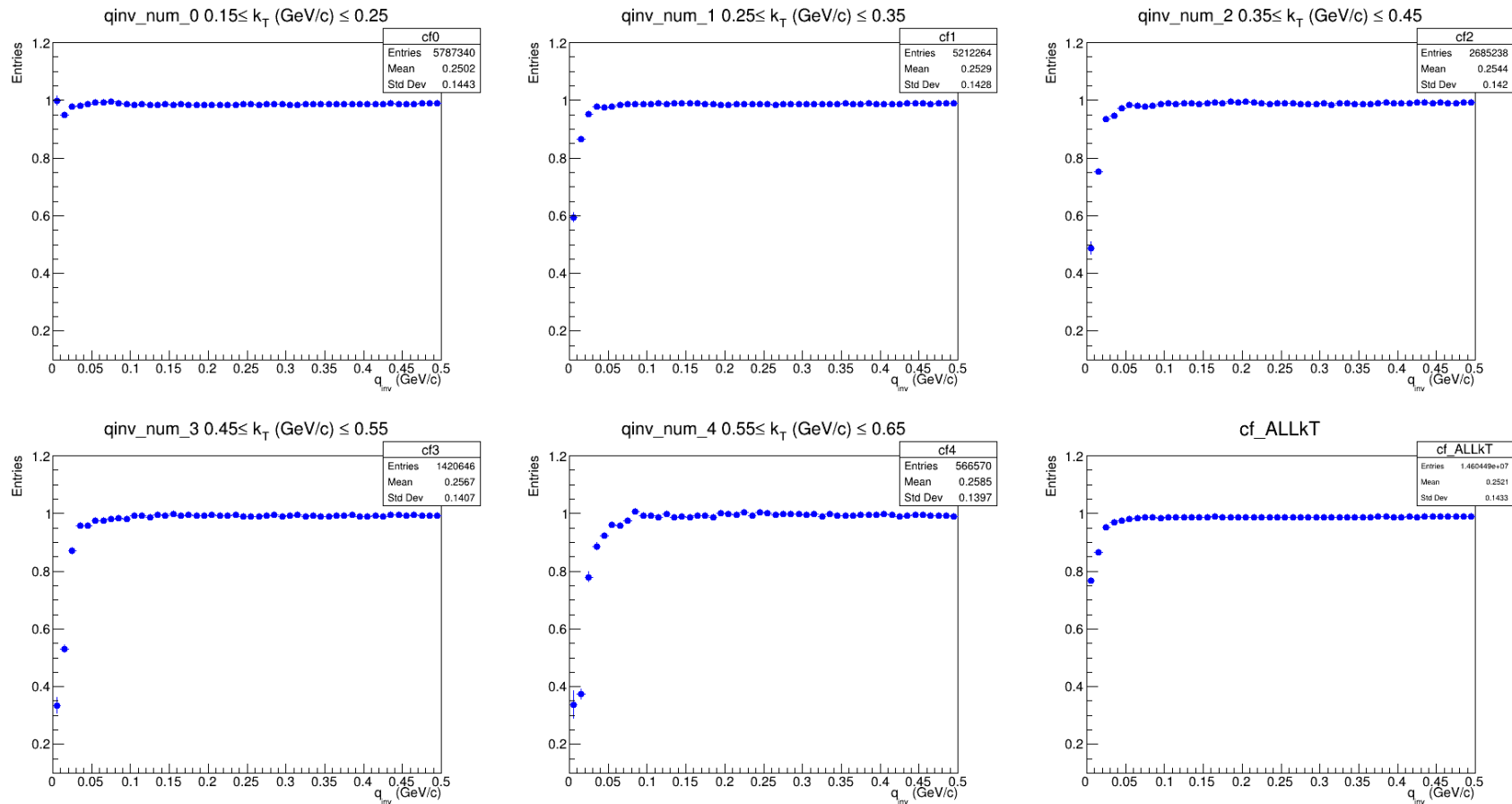


```
bool mGoodPair = (
    (pair->quality() >= mQuality[0]) &&
    (pair->quality() <= mQuality[1]) &&
    (pair->kT() >= mKt[0]) &&
    (pair->kT() <= mKt[1]) &&
    (pair->pT() >= mPt[0]) &&
    (pair->pT() <= mPt[1]) &&
    (pair->openingAngle() >= mOpeningAngle[0]) &&
    (pair->openingAngle() <= mOpeningAngle[1]) &&
    (pair->rapidity() >= mRapidity[0]) &&
    (pair->rapidity() <= mRapidity[1]) &&
    (pair->eta() >= mEta[0]) &&
    (pair->eta() <= mEta[1]) &&
    (pair->qInv() >= mQinv[0]) &&
    (pair->qInv() <= mQinv[1]) &&
    (pair->mInv() >= mMinv[0]) &&
    (pair->mInv() <= mMinv[1]) &&
    (pair->emissionAngle() >= mAngleToPrimaryVertex[0]) &&
    (pair->emissionAngle() <= mAngleToPrimaryVertex[1]) &&
    (pair->nominalTpcEntranceSeparation() >= mEntranceSeparation[0]) &&
    (pair->nominalTpcEntranceSeparation() <= mEntranceSeparation[1]) &&
    (pair->fractionOfMergedRow() >= mFracOfMergedRow[0]) &&
    (pair->fractionOfMergedRow() <= mFracOfMergedRow[1]) &&
    (pair->closestRowAtDCA() >= mClosestRowAtDCA[0]) &&
    (pair->closestRowAtDCA() <= mClosestRowAtDCA[1]) &&
    (pair->weightedAvSep() >= mWeightedAvSep[0]) &&
    (pair->weightedAvSep() <= mWeightedAvSep[1]) &&
    (pair->nominalTpcAverageSeparation() >= mAverageSeparation[0]) &&
    (pair->nominalTpcAverageSeparation() <= mAverageSeparation[1]) &&
    (pair->rValue() >= mRValueLo) &&
    (dPhiStarMin >= mDPhiStarMin[0]) &&
    (dPhiStarMin <= mDPhiStarMin[1])
);
```

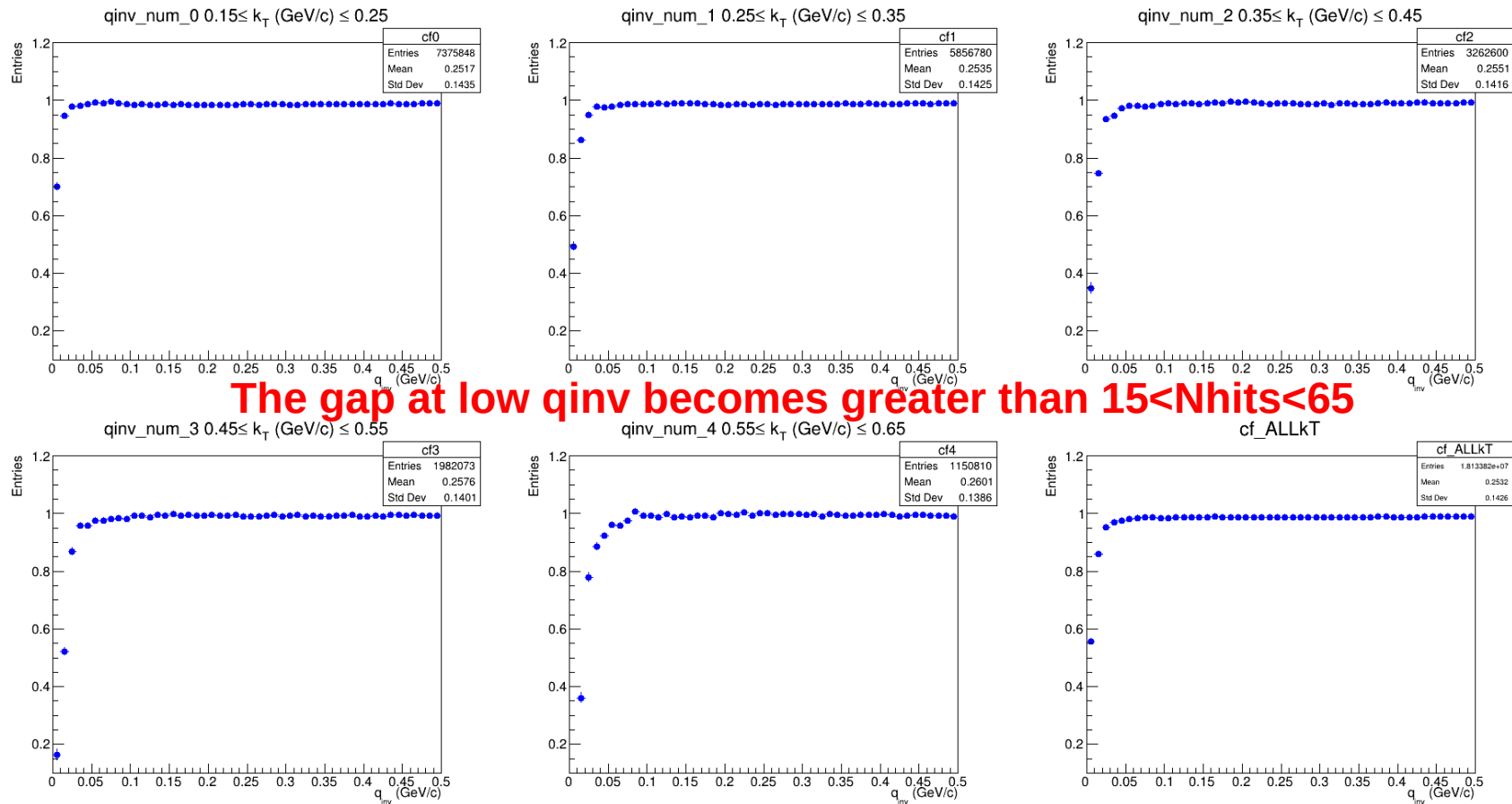
a reverse condition

--- MpdFemtoBasicPairCut.cxx 37% L187 Git-dev (C++/l -1 Abbrev)

CF with standard cuts



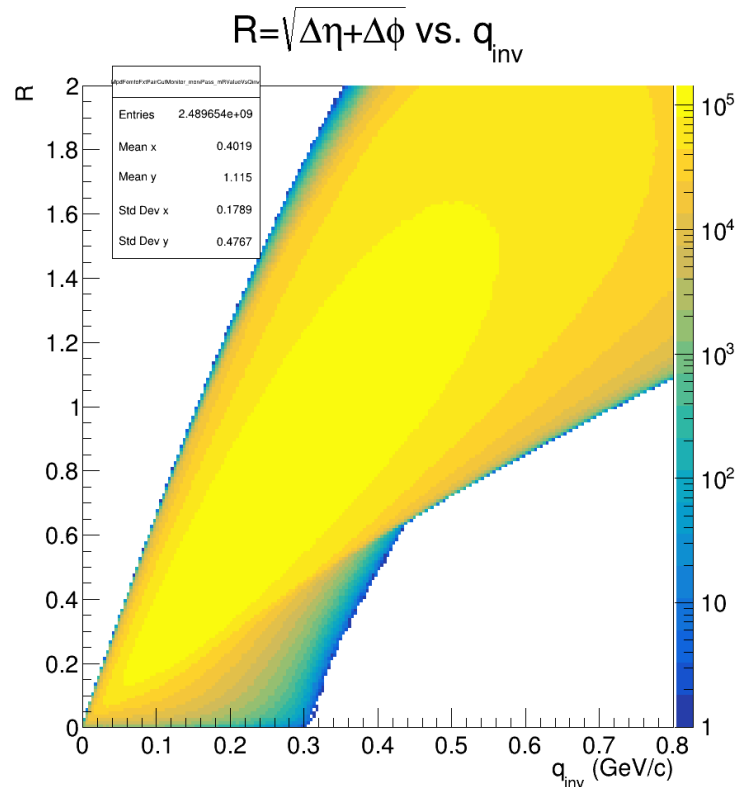
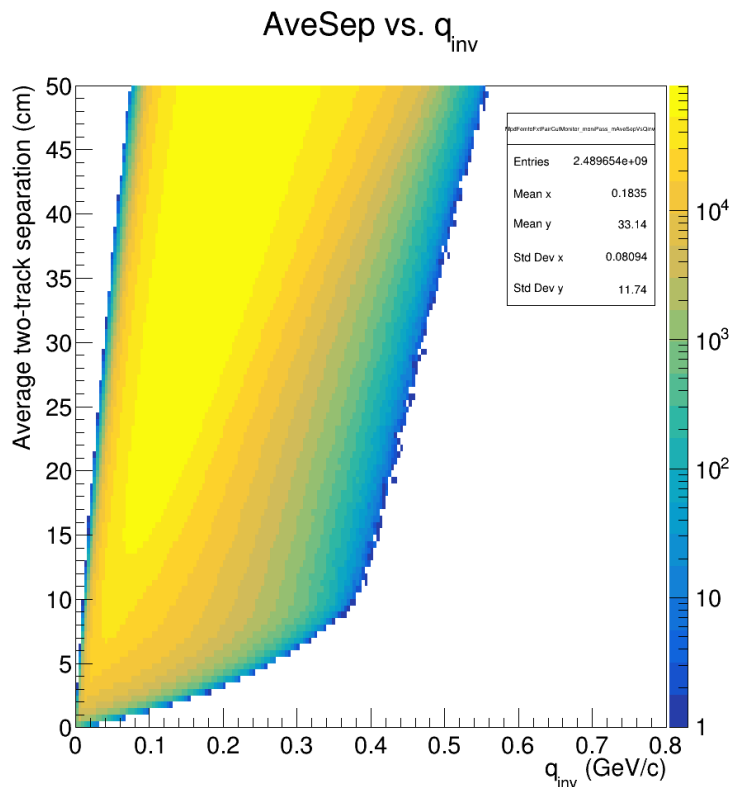
CF with standard cuts & $25 < N_{\text{hits}} < 65$



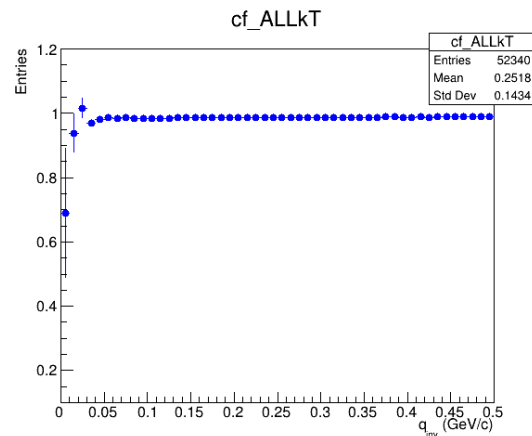
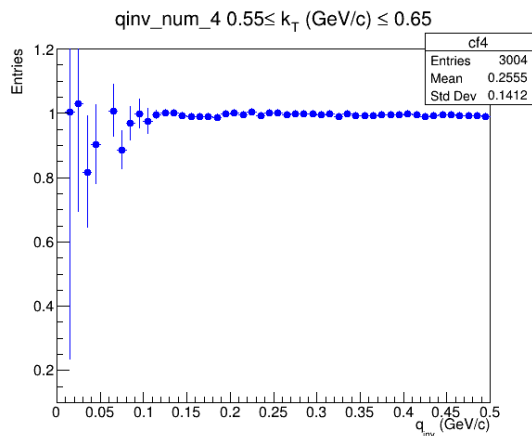
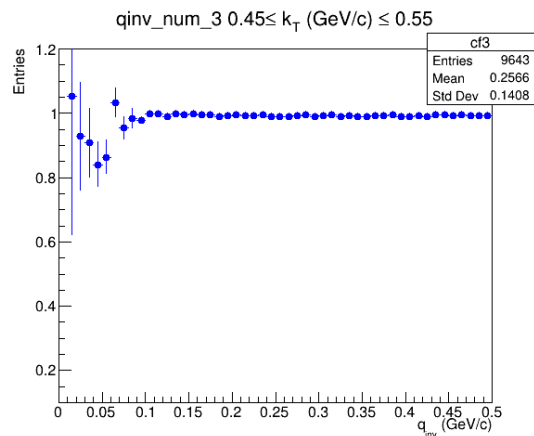
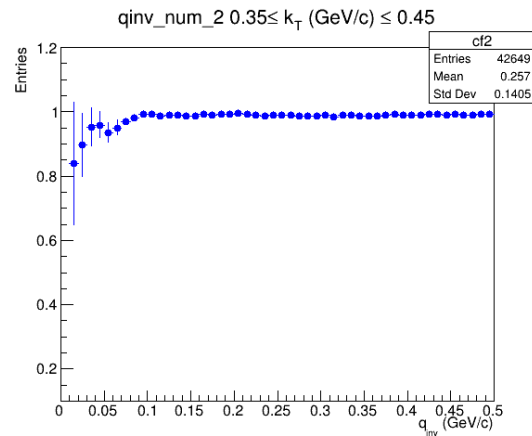
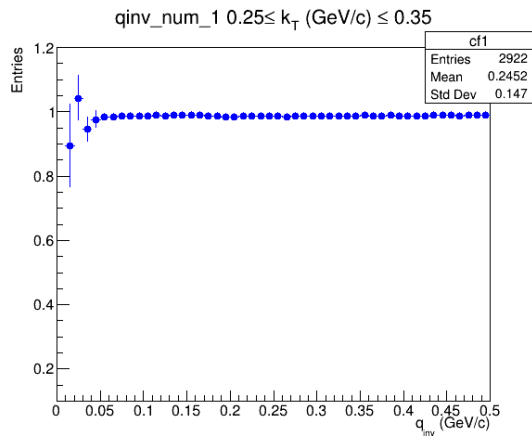
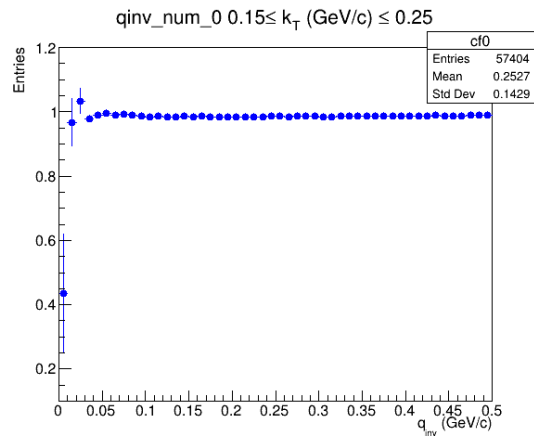
hbtMiniDst.C additional cuts

`pairCut->setAverageSeparation(5,1e6);` // Set cut on average separation between tracks in TPC (min, max)

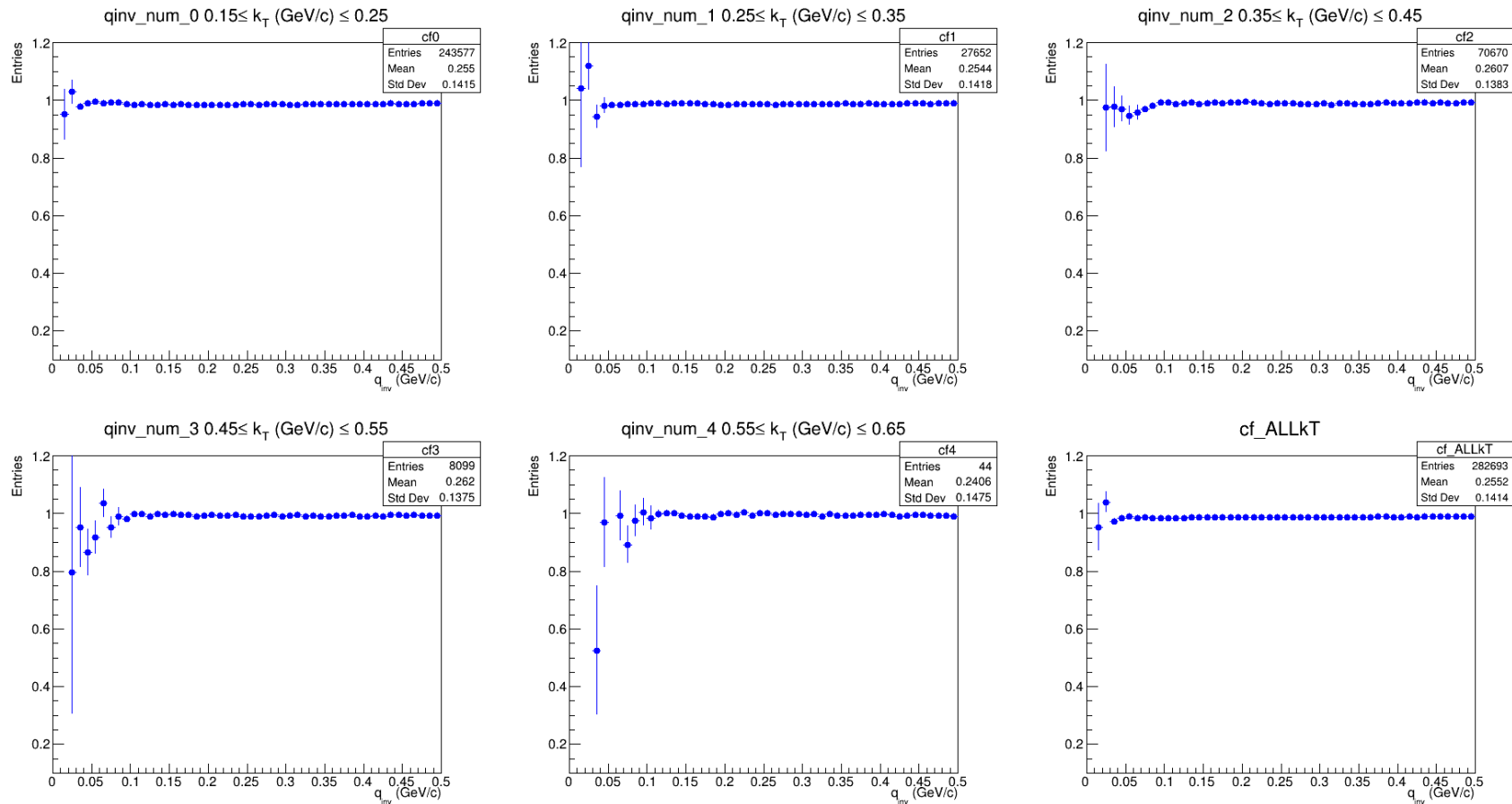
`pairCut->setRValue(0.05);` // Set cut on $R = \sqrt{d\eta^2 + d\phi^2}$ (low)



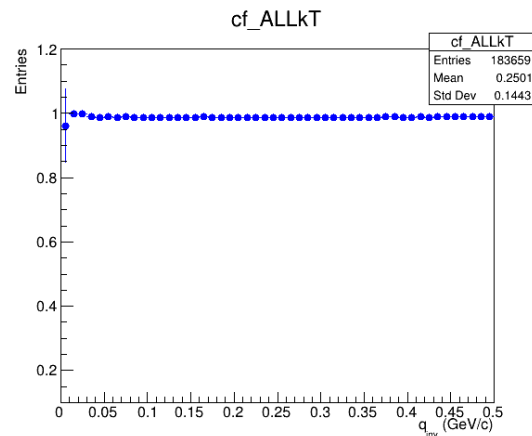
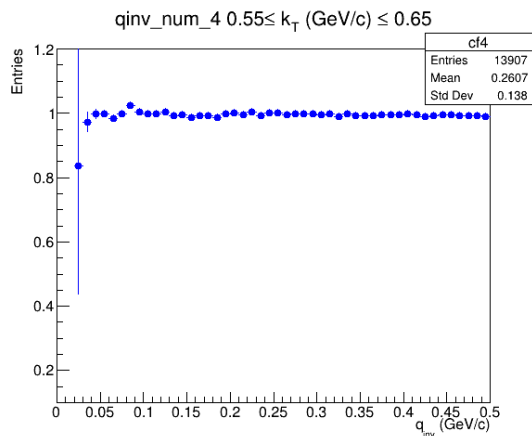
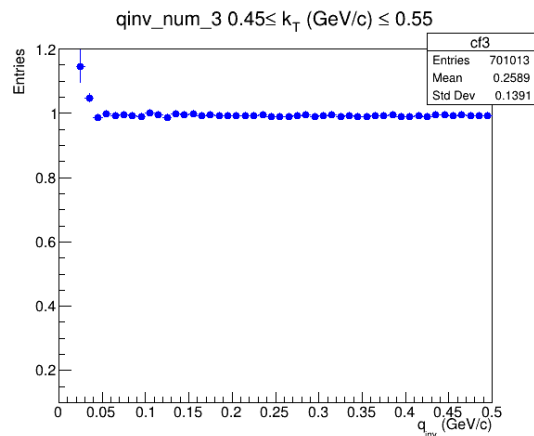
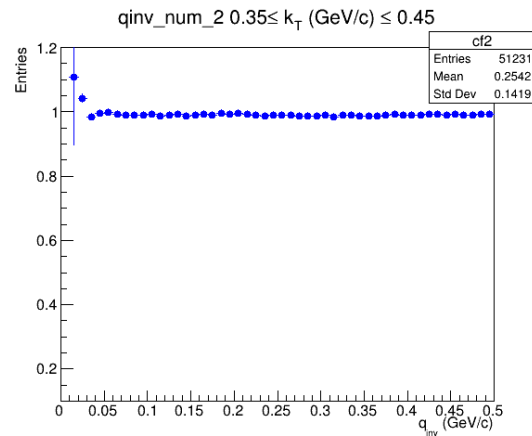
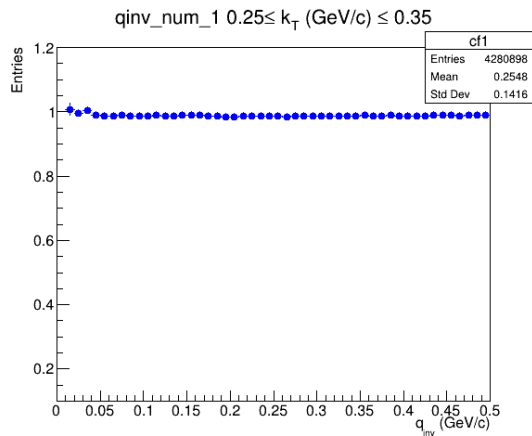
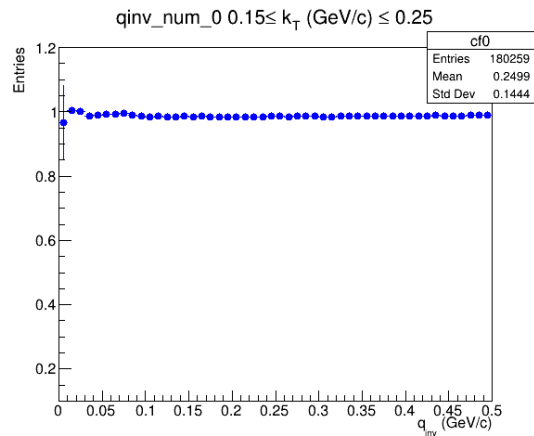
CF, $\sqrt{\Delta\eta^2 + \Delta\phi^2} > 0.2$ (cut1)



CF, AveSep>5 && $\sqrt{\Delta\eta^2 + \Delta\phi^2} > 0.2$ (cut2)



CF, AveSep>5 && $\sqrt{\Delta\eta^2 + \Delta\phi^2} > 0.05$ (cut3)



Conclusions

- There is a significant splitting in CF with standard cuts
- The splitting effect increases with increasing Nhits cut
- Two additional cuts:
 - Average separation between two tracks
 - Angular distance $\sqrt{\Delta\eta^2 + \Delta\phi^2}$
- These two cuts did a good job with:
$$\text{AveSep} > 5 \ \&\& \ \sqrt{\Delta\eta^2 + \Delta\phi^2} > 0.05$$