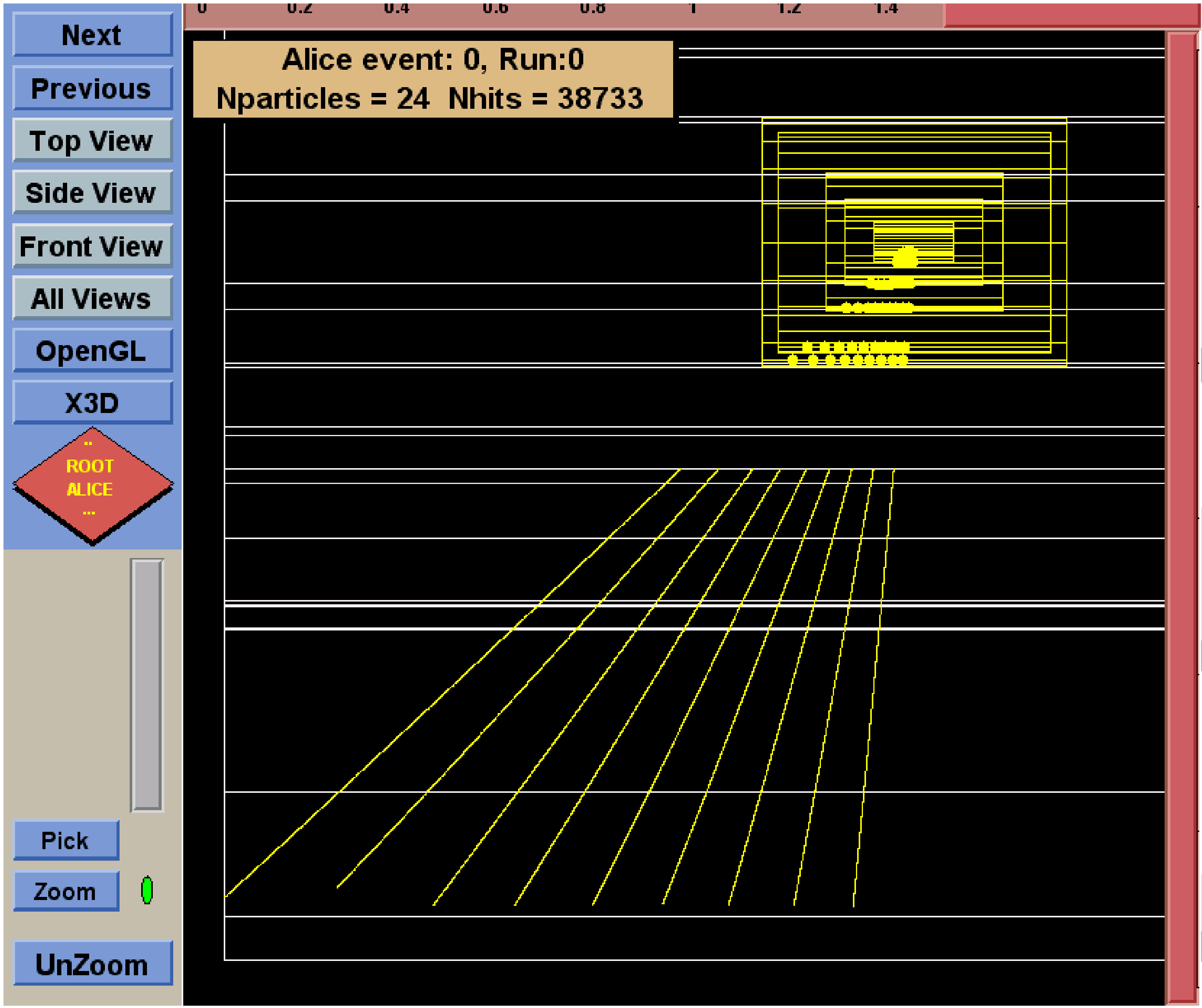
TPC Track Efficiency

ALICE monthly offline meeting, 17.5.2002

Jiri.Chudoba@CERN.CH

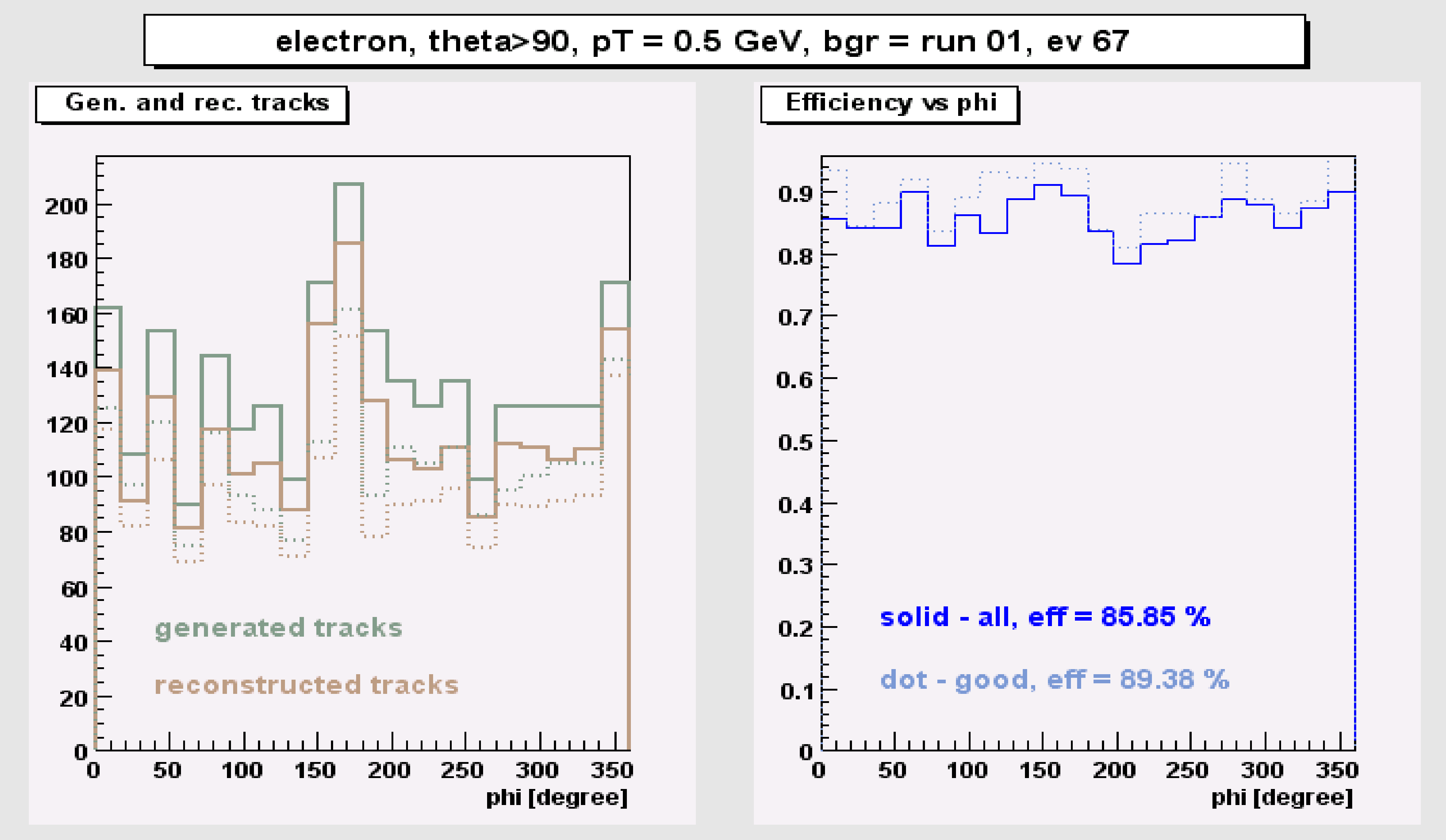
Setup

- Background files from PPR test production, sdigits created with patched aliroot version from April 2002:
  - TPC has 3 pad sizes, step function for efficiency at the end of wires (this is already changed in CVS)
  - ITS is not used in reconstruction
- Signal events:
  - vertex set to the same position as bgr event vertex
  - each event has 9 tracks with the same phi and different theta
  - pT is set constant in a given set, not p

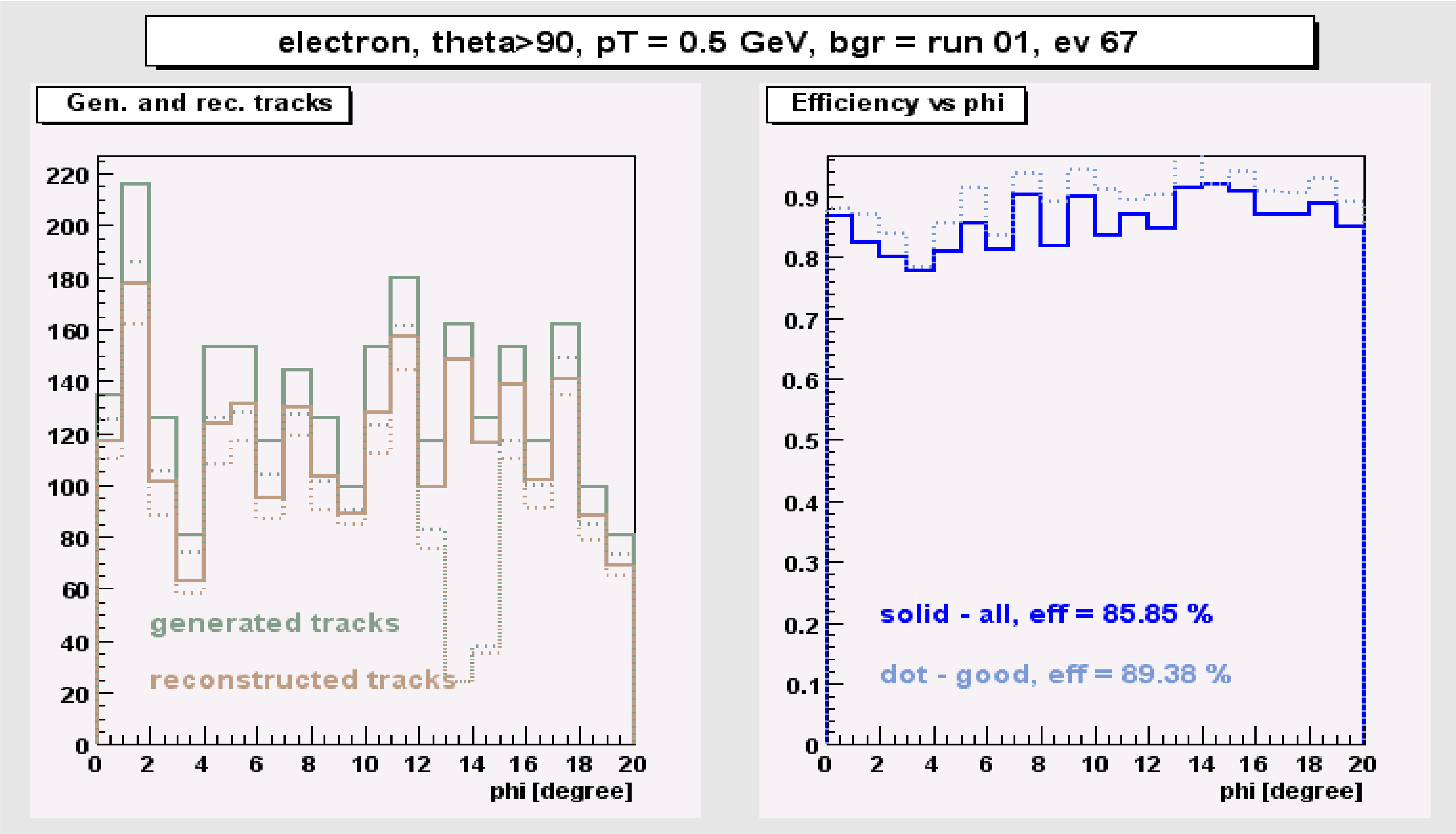

Next
Previous
Top View
Side View
Front View
All Views
OpenGL
X3D
ROOT
ALICE
Pick
Zoom
UnZoom
Alice event: 0, Run:0
Nparticles = 24 Nhits = 38733
0
0.2
0.4
0.6
0.8
1
1.2
1.4

Reconstruction and Comparison

- slightly modified AliBarrelReconstruction:
  - input from digits.root file, gAlice is taken from that file
  - no ITS reconstruction
- Comparison:
  - good tracks must satisfy these conditions:
    - contain 2 TPC special hits in the first row
    - digits in > 40% of rows, digits in seeding rows
    - pT > fgkMinPt = 0.3 GeV
    - primary track
  - Unfortunately the code from AliTPCComparison.C cannot be used directly, should be more modular

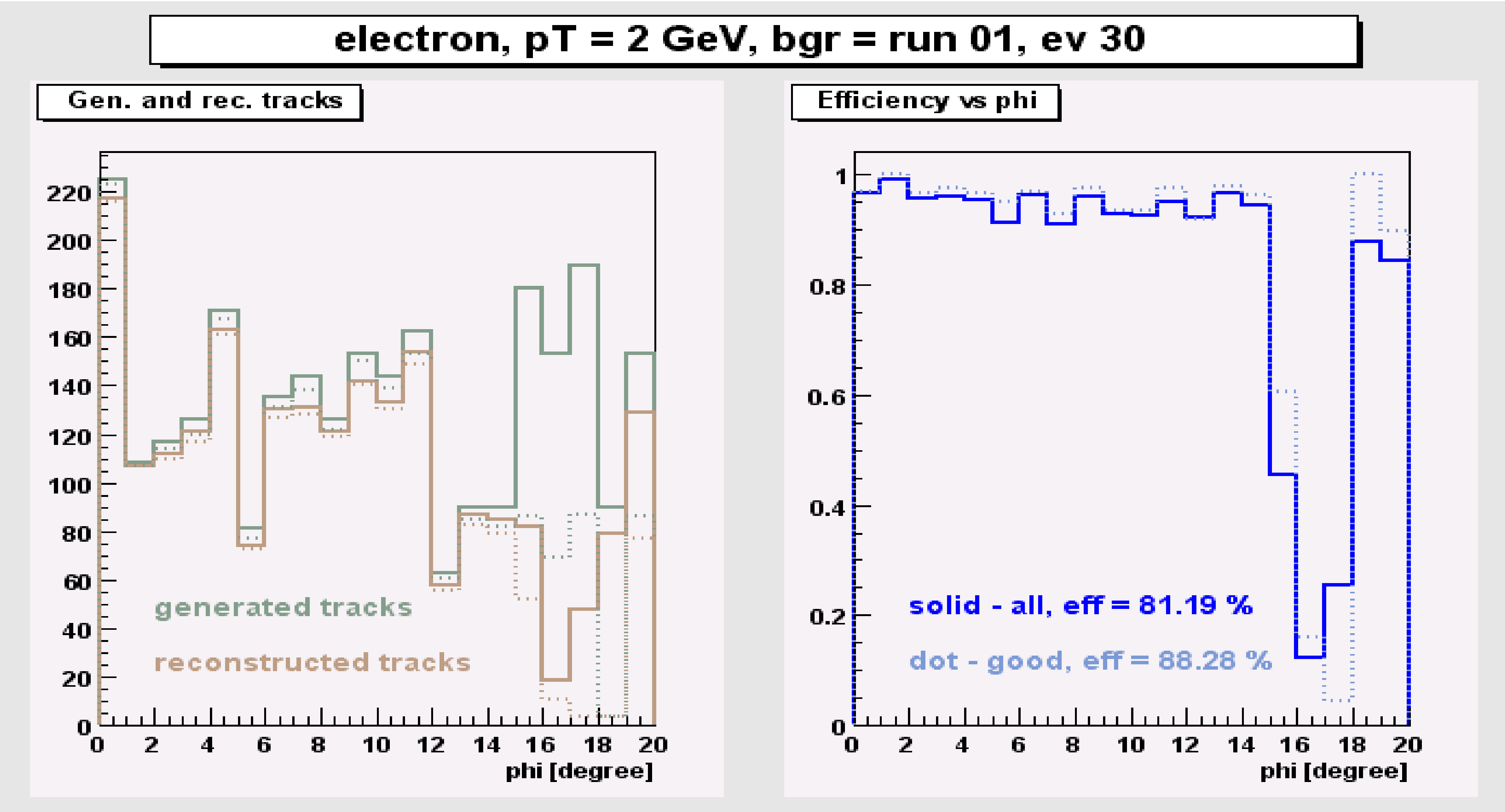


– no obvious pattern, good

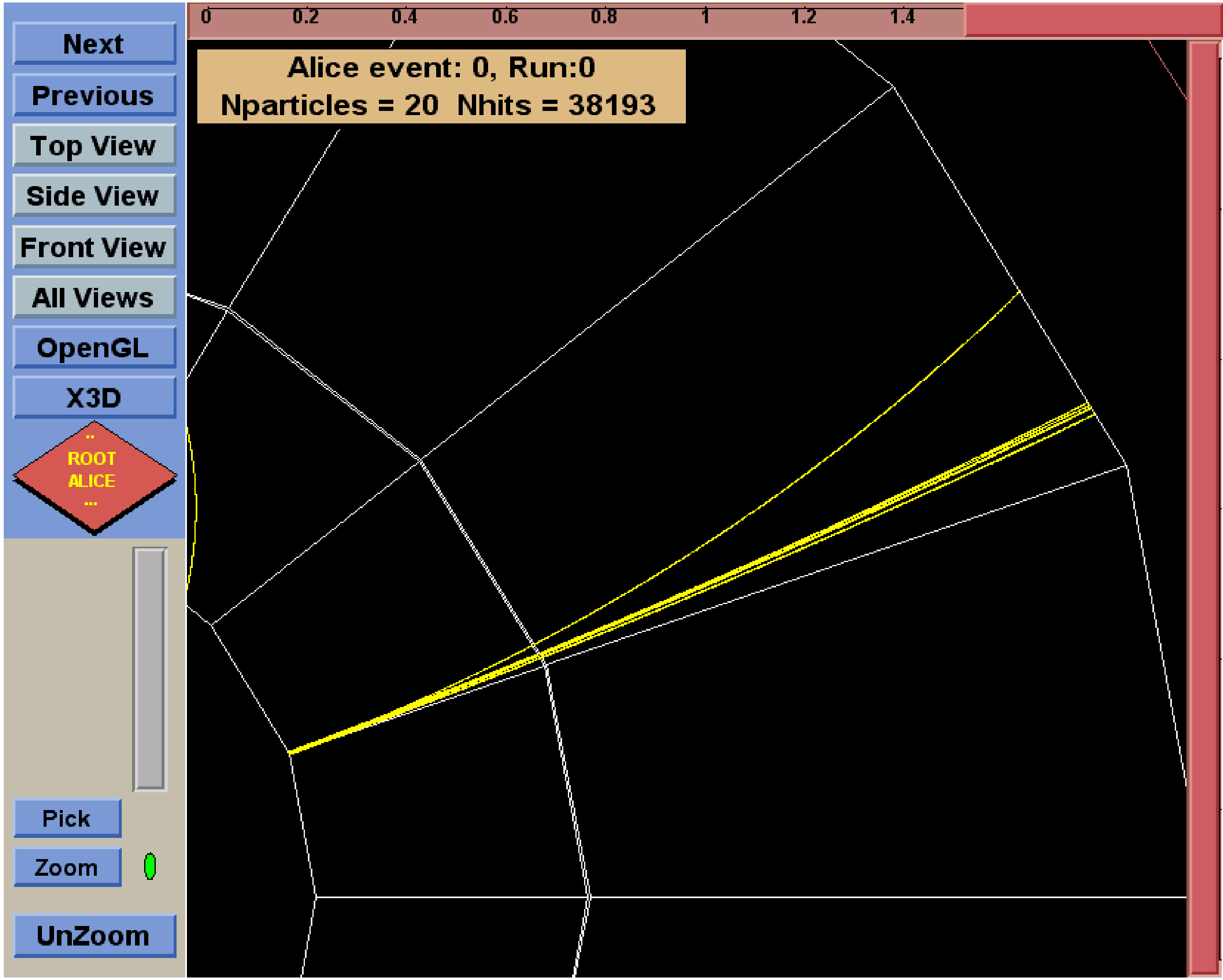


– only a few good tracks in the interval 13–15 degree:
mainly because the special TPC hit is missing

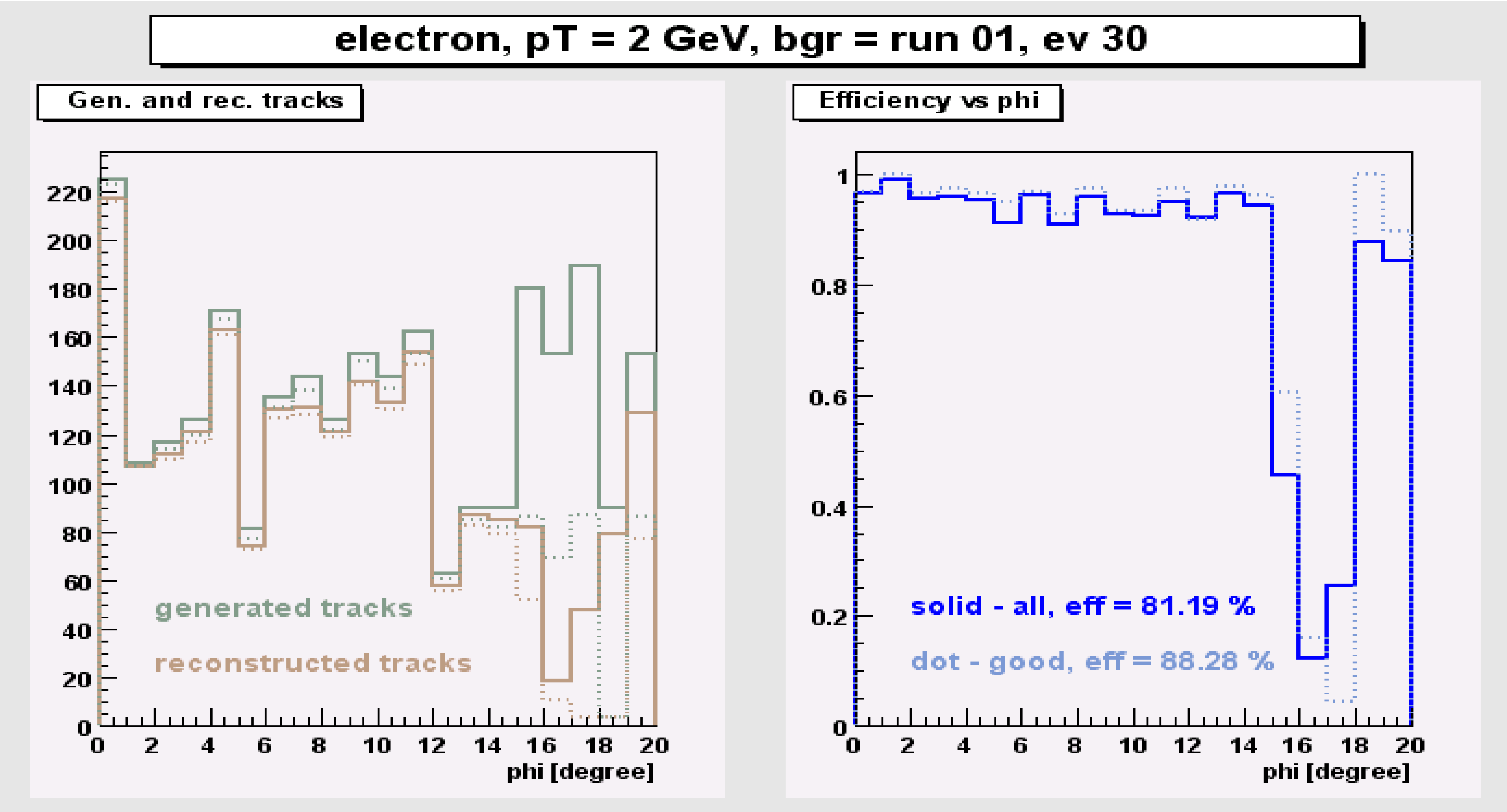
– no dip in efficiency



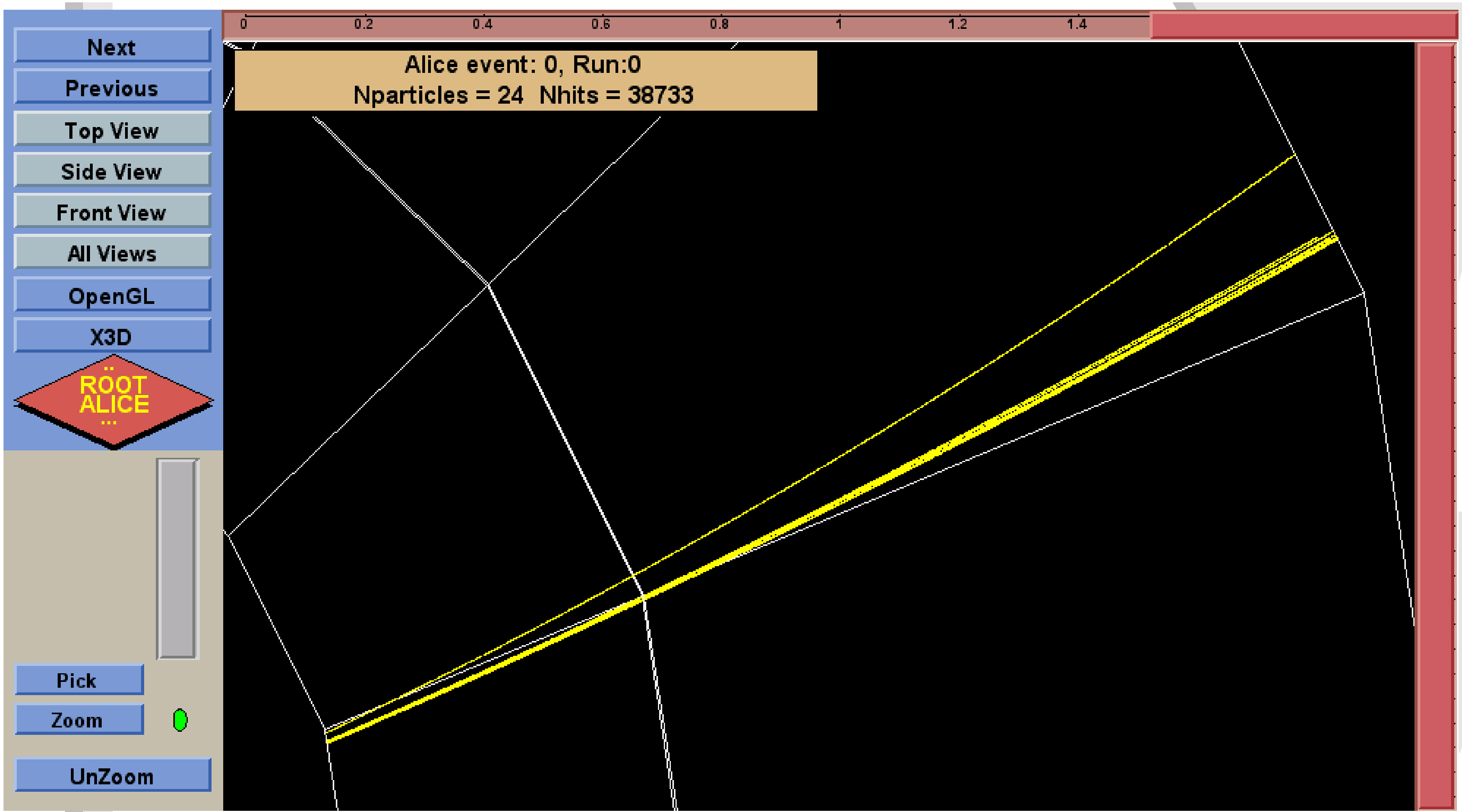
– low efficiency in the interval 15–18, even for good tracks



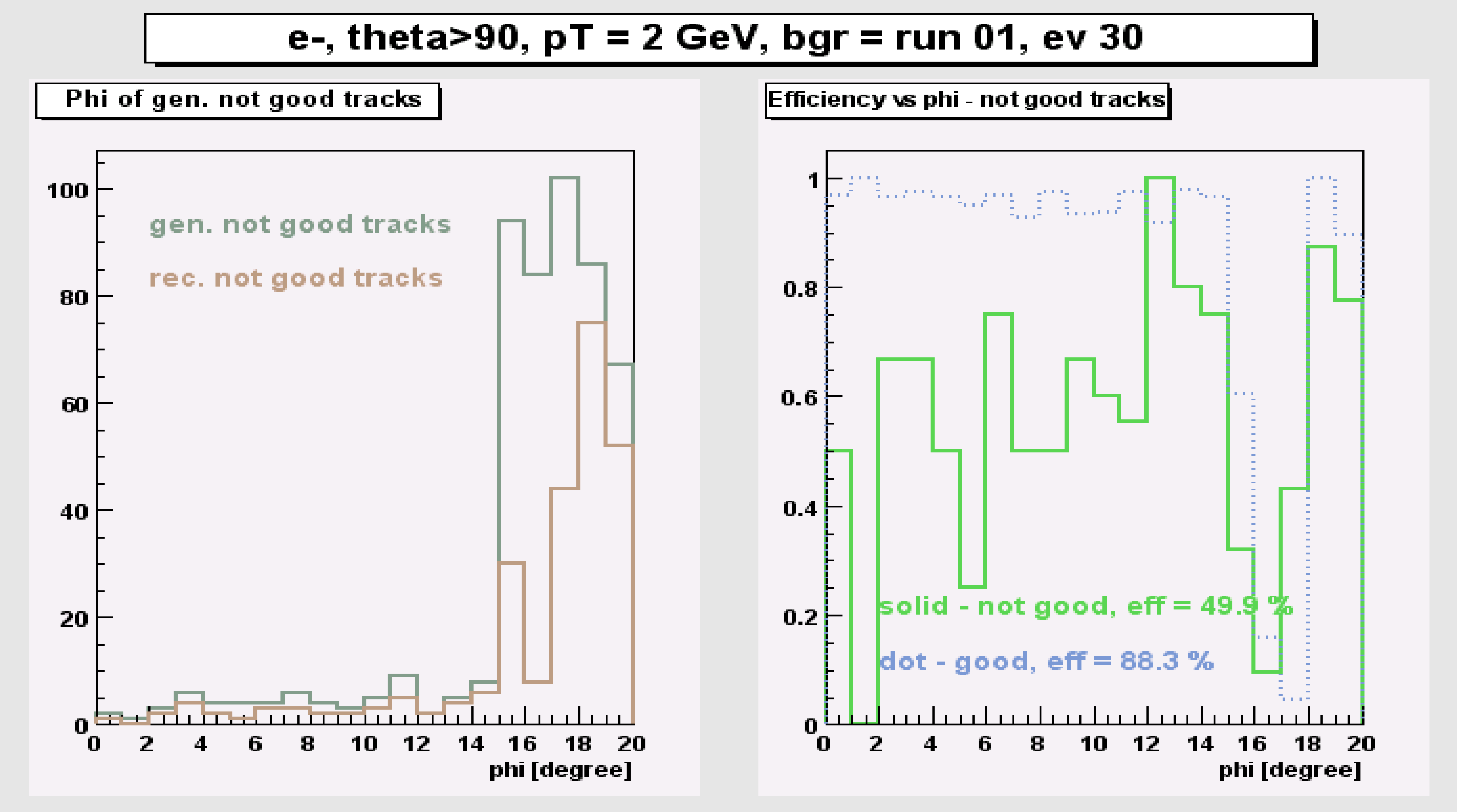
phi = 18.5 degree => tracks are not classified as good, the special TPC hit is missing. But many are reconstructed

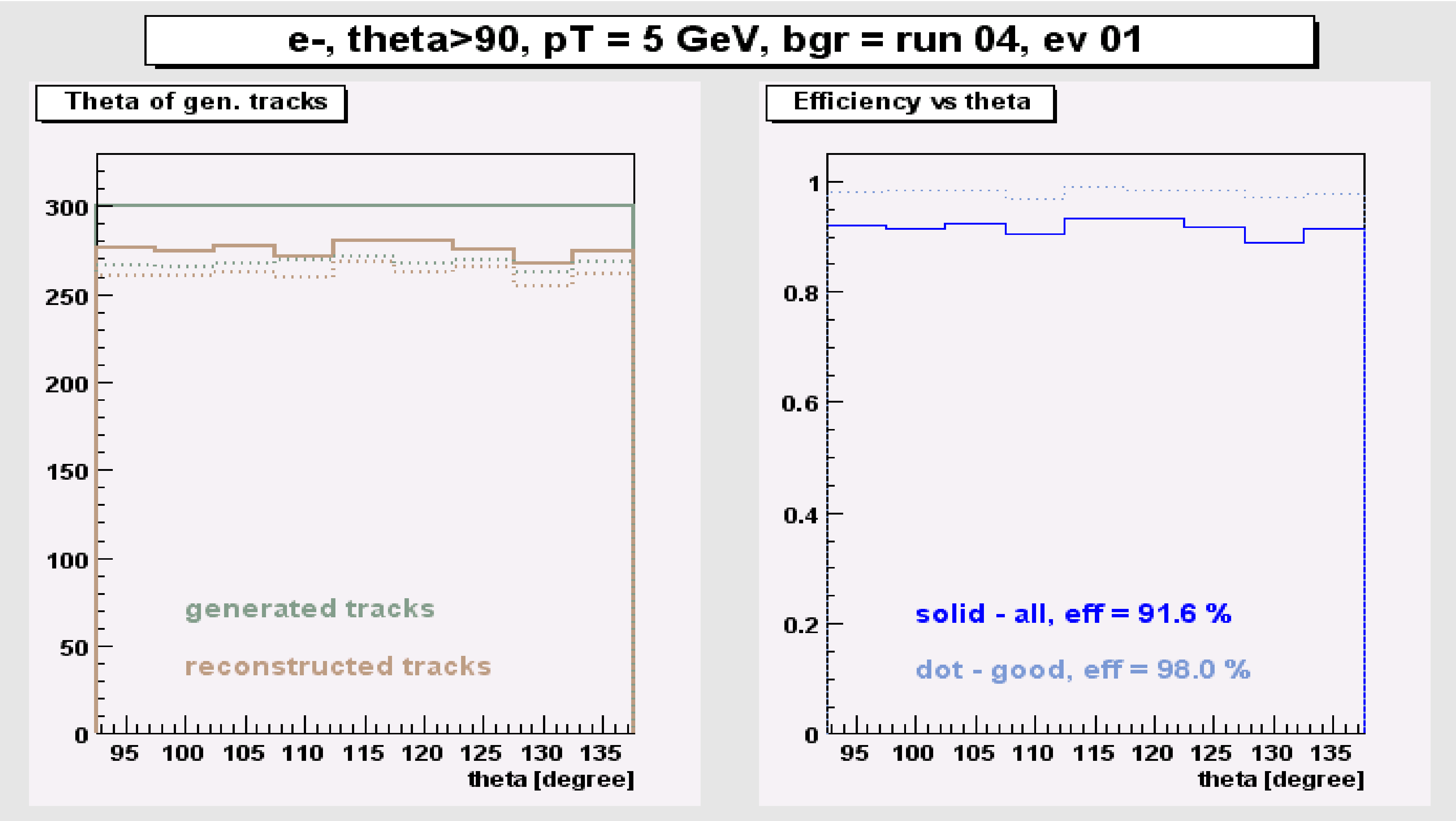


– low efficiency in the interval 15–18, even for good tracks



phi = 17.5 degree => many tracks classified as good, but not reconstructed


e-, theta>90, pT = 2 GeV, bgr = run 01, ev 30
Phi of gen. not good tracks
gen. not good tracks
rec. not good tracks
phi [degree]
Efficiency vs phi - not good tracks
solid - not good, eff = 49.9 %
dot - good, eff = 88.3 %
phi [degree]



– no dependance on theta

Results for pi minus

pT [GeV]	z side	bgr	eff good [%]	eff all [%]
0.5	–	00001/00030	84	77
2	–	00001/00030	86	76
5	–	00001/00030	95	86
5	–	00001/00067	96	86
5	–	00002/00002	99	88

each sample has more than 2500 tracks

Results for electron

pT [GeV]	z side	bgr	eff good [%]	eff all [%]
0.5	–	00001/00030	90	87
0.5	–	00001/00067	89	86
0.5	+	00001/00030	94	89
2	–	00001/00030	88	81
5	–	00001/00030	95	89
2	–	00002/00002	93	88

Results for electron II

pT [GeV]	z side	bgr	eff good [%]	eff all [%]
0.5	–	00003/00001	99	94
2	–	00003/00001	95	90
5	–	00003/00001	99	92
0.5	–	00010/00002	99	95
2	–	00010/00002	96	91
5	–	00010/00002	99	91
0.5	–	00004/00001	97	93
2	–	00004/00001	93	88
5	–	00004/00001	98	92

Conclusions

- the special hit in TPC should be written even if the track does not enter sensitive volume to be able to do comparisons
- efficiency for tracks with pT around 2 GeV crossing the dead region is quite low
- TPC has still incorrect cross talk in the first and last pad - should we wait for fix before starting production?