TOF Calibration & Software Progress

Xin Dong

for TOF Group

Calibration Status

-- 62GeV results

-- 200GeV

TOF Offline software
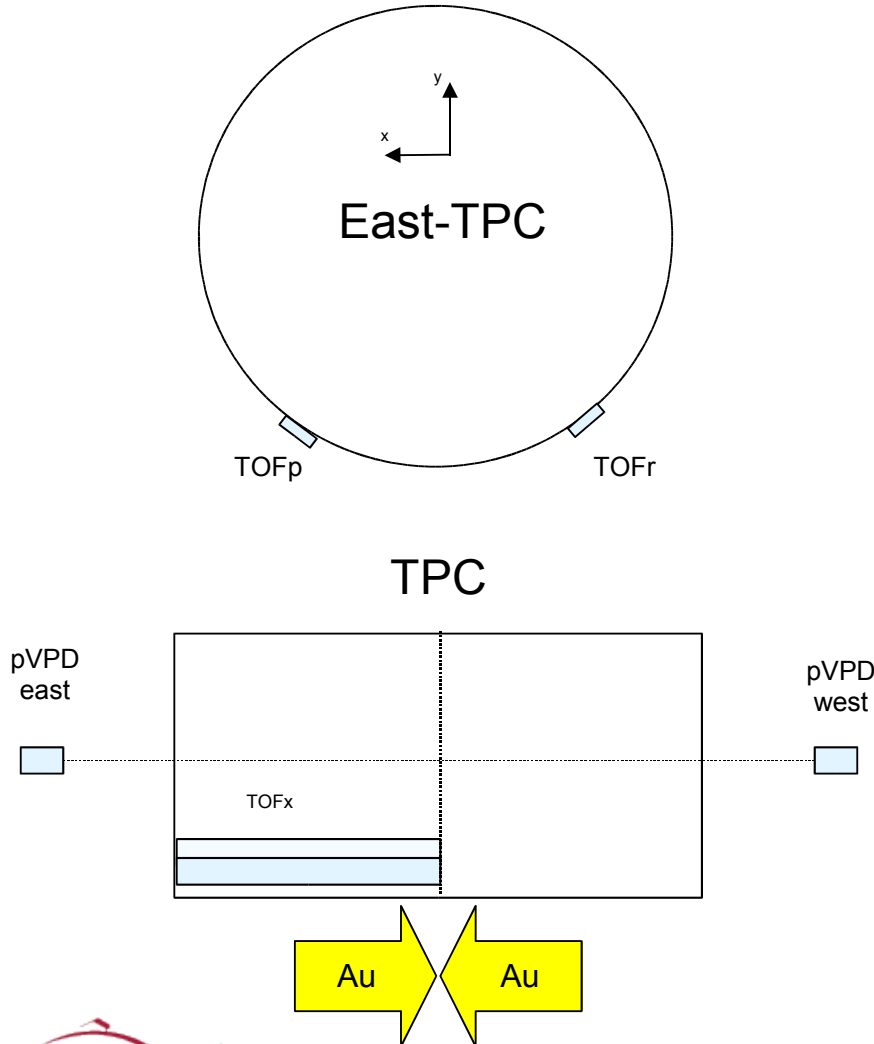
-- Data base

-- Makers

- match

- calibration

- MuDst

Where are we & usage of TOF?
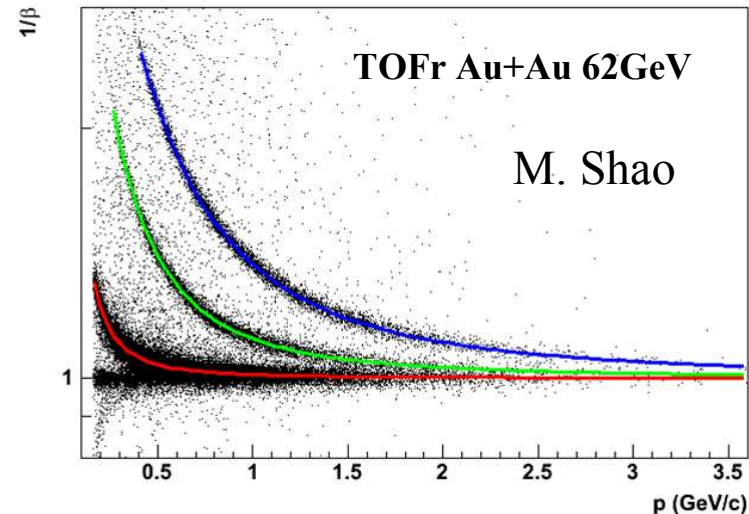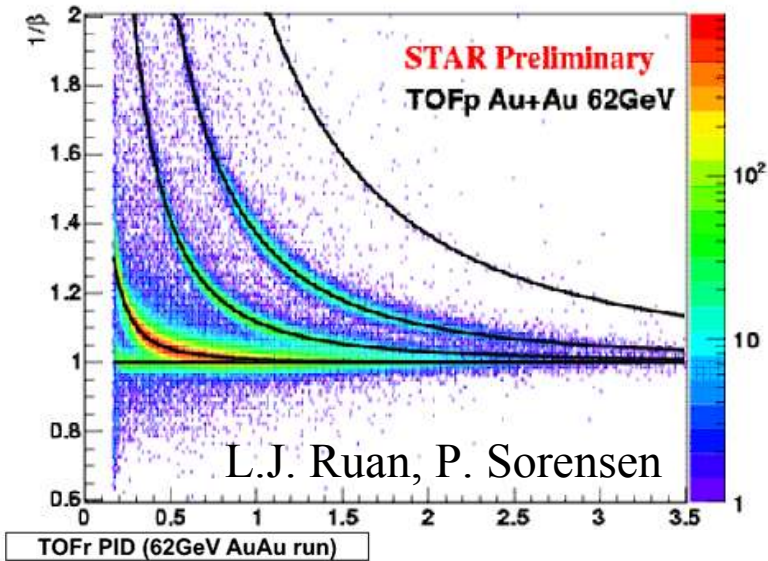
TOF detectors in Run IV

East-TPC

TOFp   TOFr

TPC

pVPD
east

pVPD
west

TOFx

Au   Au

Some changes this year:

➤ pVPDs moved ~4'' further from Z=0
➤ TOFp moved one slot clockwise when facing west from the east side
    --- read out channels no change (41)
➤ TOFr did not move, but the tray size and module positions in the tray changed
    --- First 20 modules (out of 32) in the tray have read-out electronics (72+48 channels totally)
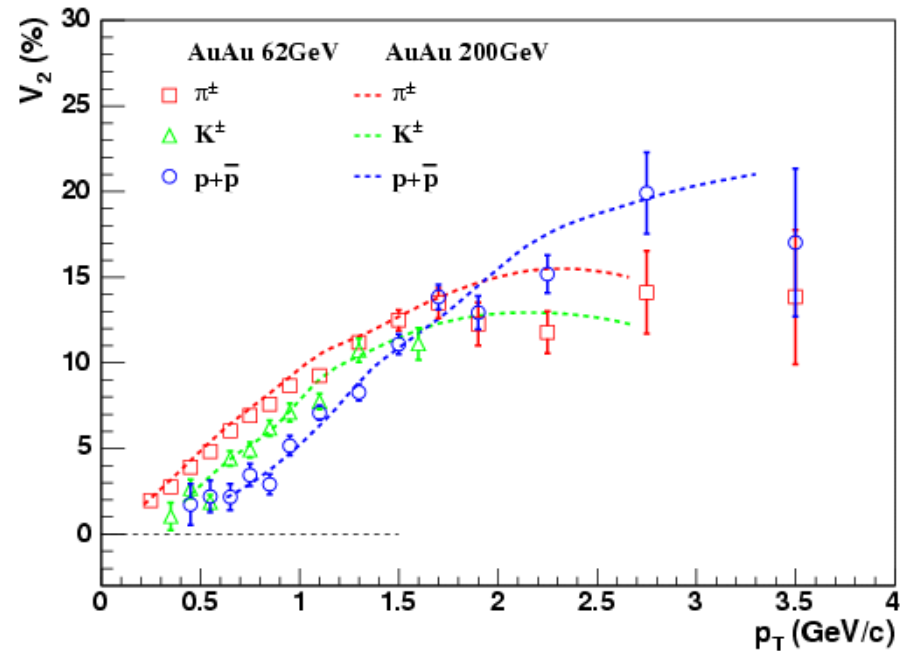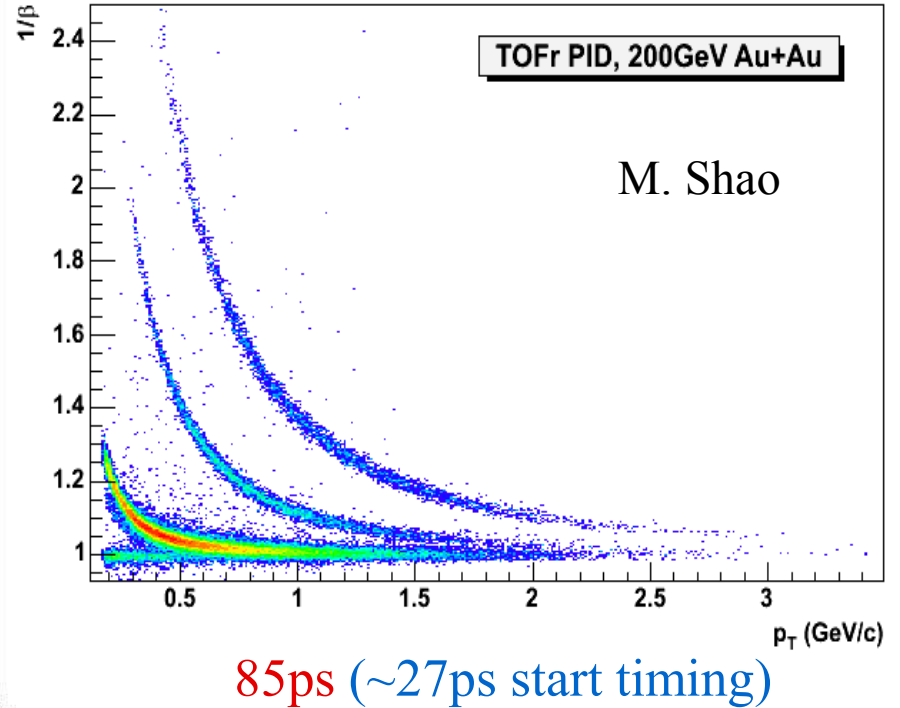
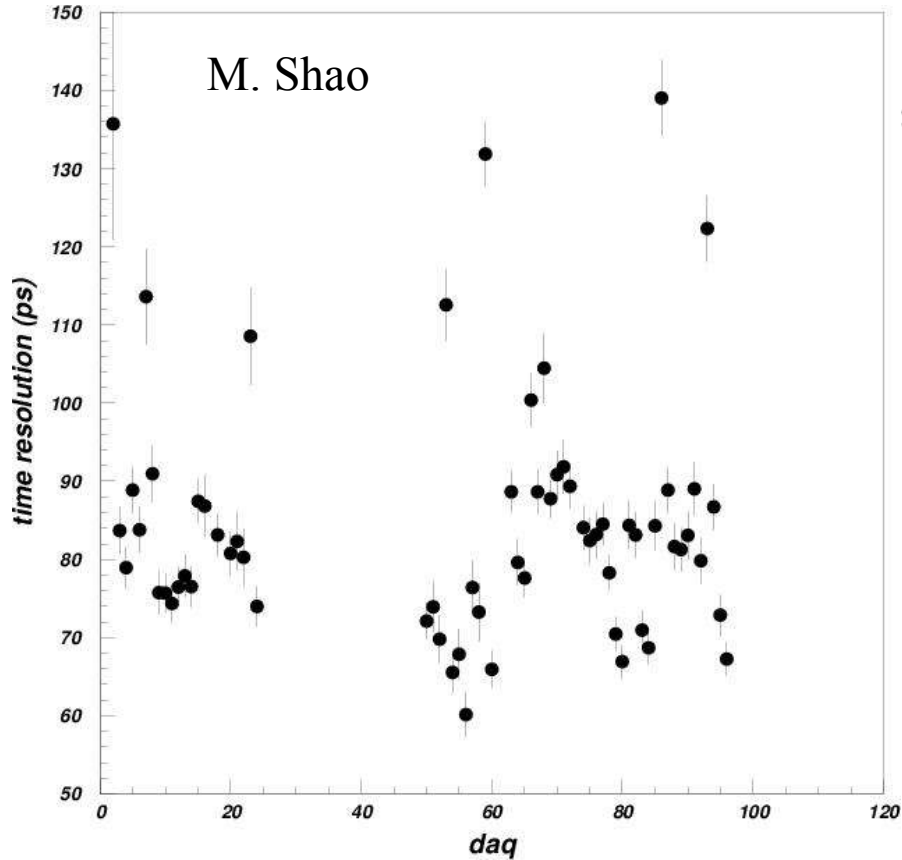~110ps resolution in both TOFr & TOFp systems.
(~55ps starting timing resolution)

M. Shao

M. Shao

TOFr PID, 200GeV Au+Au

85ps (~27ps start timing)

TOFp TimeResolution for AuAu200GeV Feb09_Mar1TZv1

July 17th, 04, Collaboration Meeting, BNL   X.Dong, USTC/LBNL

TOF detectors performance

		Timing Resolution (ps)		
		pPVDs	TOFr system	TOFp system
Run III	d+Au @ 200GeV	85	120 (85)	100-140
	p+p @ 200GeV	140	160 (85)	-
Run IV	Au+Au @ 62GeV	55	105 (89)	110 (95)
	Au+Au @ 200GeV — FF&RFF, w/o E pVPD	40	95 (86)	147 (134)
	Au+Au @ 200GeV — FF&RFF	27	86 (82)	120-130 (117)
	Au+Au @ 200GeV — HF	20	82 (80)	137 (135)

TOF dbase

Data Base | Many new introduced structures

➤TOF configurations --- ready
    --- pVPD configuration
    --- pVPD Strobe events configuration
    --- tof detectors configuration
    --- tof Tray configuration
    --- tof Module configuration
➤DAQ mapping --- ready
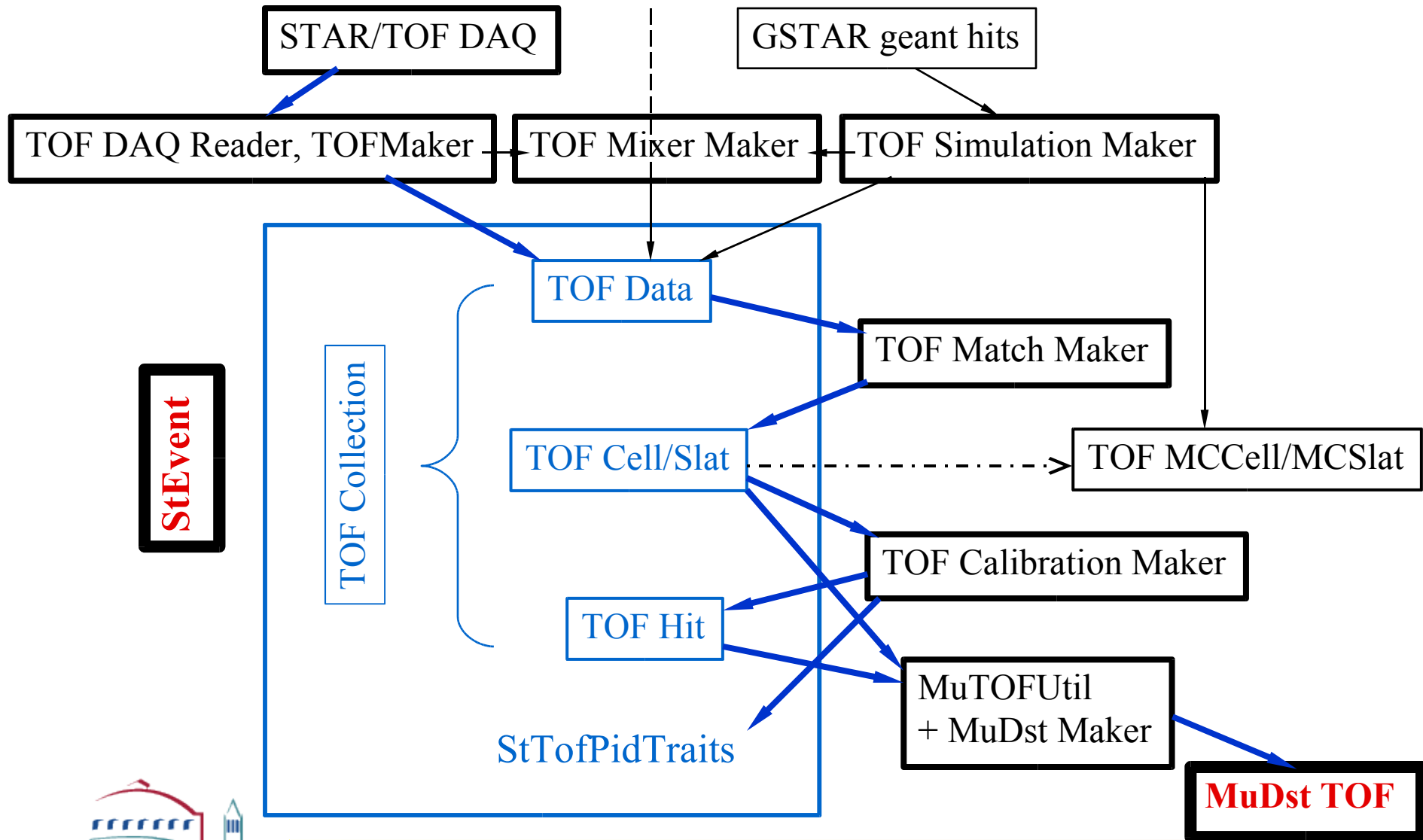   *--- tof DAQ mapping*

➤Calibration parameters --- ready
    --- tof T0 (timing offset)
    --- tof Correction (overall)
    --- tof Correction (each channel)
➤Timing resolution --- ready
➤Simulation parameters --- ready
    --- MRPC simulation parameters
➤TOFp Geometry

Calibrations for AuAu 200GeV are done, (M. Shao, J.S. Wang et al.)
-- parameters have been put into dbase
➔ Ready for the production !

TOF Offline Software

Where are we?

Ready!
➔ Waiting for the production!

MuDst structure:

MuEvent
MuTracks (primary)
MuGlobalTracks

....
V0
....
MuTofHit (calibrated physical variables)
MuTofData (raw Tof Data for large scale calibration)
...

Usage of TOF

In StEvent:

    StTrack -> StTofPidTraits -> tof, beta, nSigmaE (Pi, K, P), etc.

In MuDst

If there is no update on the StMuTrack

```
for ( primary tracks … ) {
    StMuTrack *trk = ….
    short trkId = trk->trkId();

    ….
    for ( tofhits ) {
        StMuTofHit *tofhit = …
        if (tofhit->associatedTrackId()==trkId) {

                ….
        }
    } // end tof hit loop
} // end track loop
```
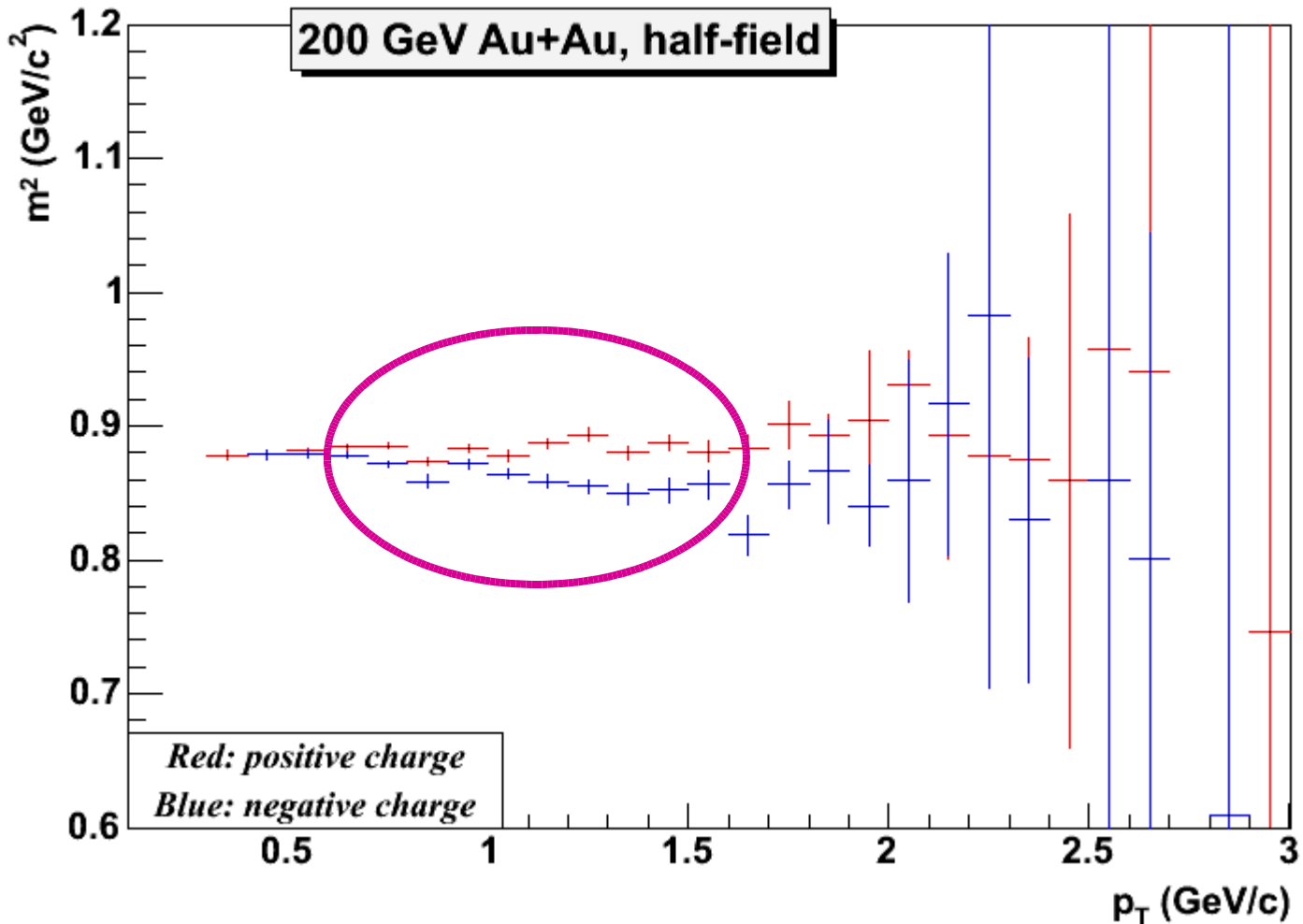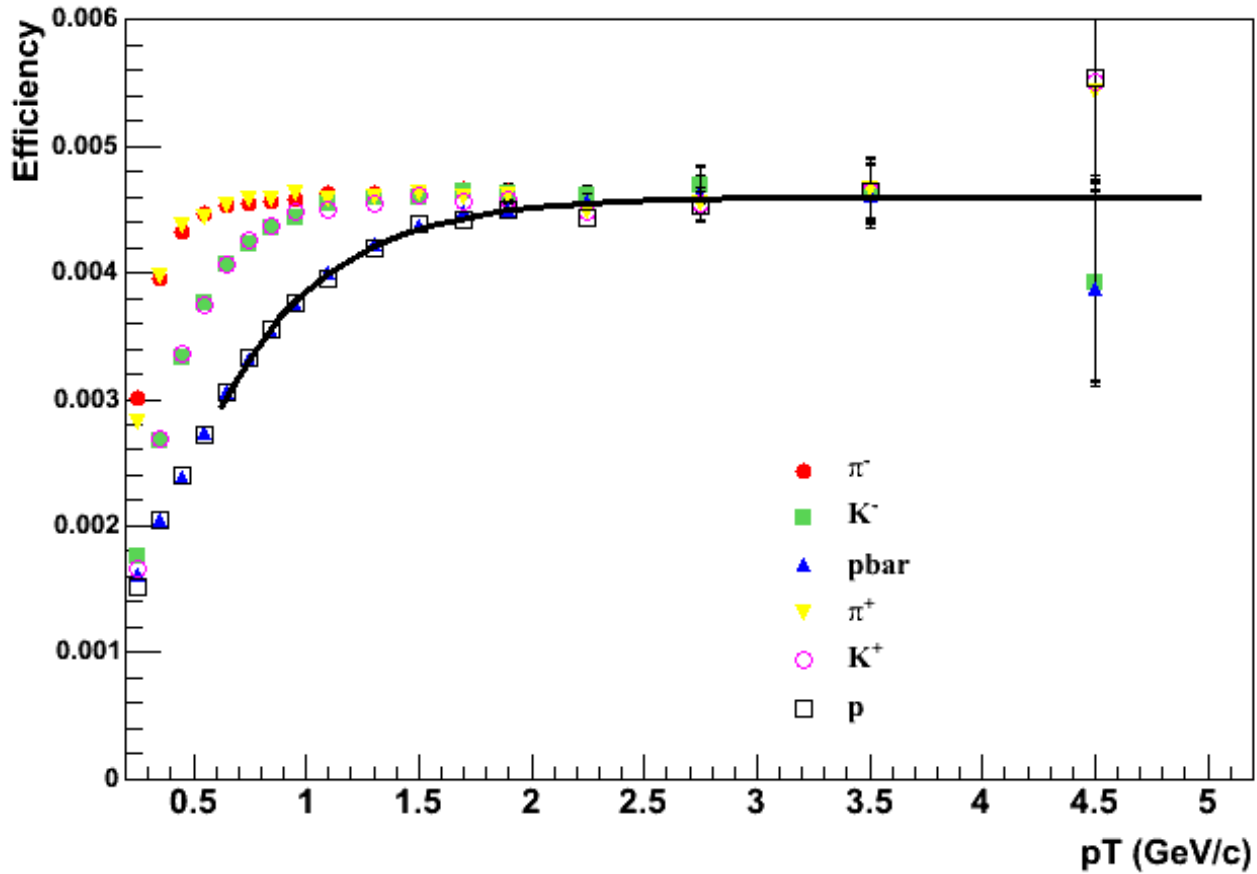
Many Thanks

To software group

backup

200 GeV Au+Au, half-field

Red: positive charge
Blue: negative charge

tofr match eff. (62 GeV AuAu)

Auau 200GeV calibration Data Set

STAR run4 200 GeV Au+Au collision

Test production : /star/data45/, /star/data36/, /star/data46/ (new)

~500k events with primary vertex

~480k pVPD fired events, ~94% of them all 6 channels fired

~300k TOFr matched tracks out of ~250k matched events

run# 22-28: ~25k matched tracks

28-35: ~35k matched tracks

57-62 (half field): ~45k matched tracks

39-56 and 63-83: ~200k matched tracks

before run# 22 no TOFr data (detector off)