Measurement of ϕ(1020) elliptic flow in MPD with enhanced production

Dataset

- UrQMD Bi+Bi at $\sqrt{s_{NN}}$ = 9.2 GeV ~100k event
- Centrality determination: **evCentrality** wagon
- Particle identification: **evPID** wagon
- Event plane measurements: **evPlane** wagon
- ϕ meson flow measurements: **flowEpPairKK**

- 50 additional ϕ-meson within an event
- Reparametrized ϕ-meson kinematics
- For reconstruction **UniGen** generator was used
- Collider mode

PID cuts

Event selection:

- cut on vertex z coordinate: *130*

PID cuts:

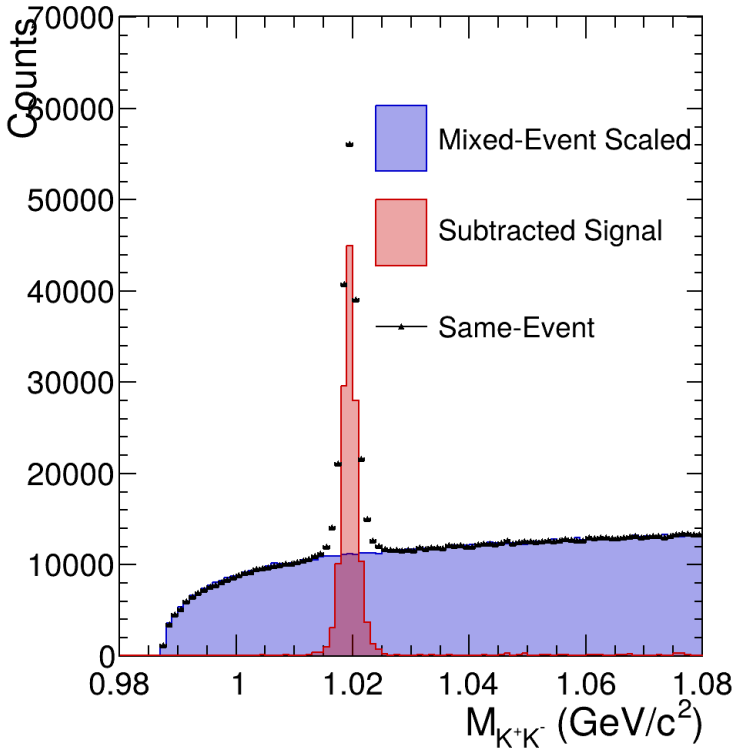
- dE/dx PID parameters: *2*
- Beta PID parameters: *2*

Track cuts:

- minimal number for a track: *24*
- maximal pseudorapidity for a track: *1*
- minimal pt for a track: *0.1*
- maximum DCA for a track: *2*

Pair cuts:

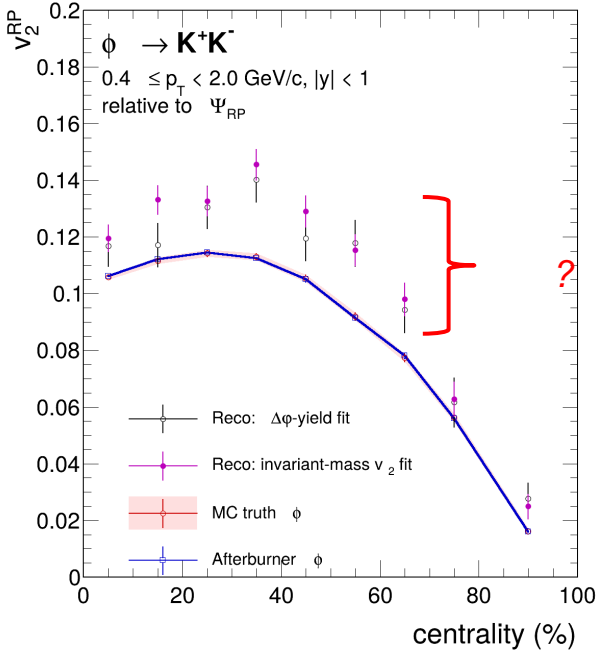
- pair cut: *1*

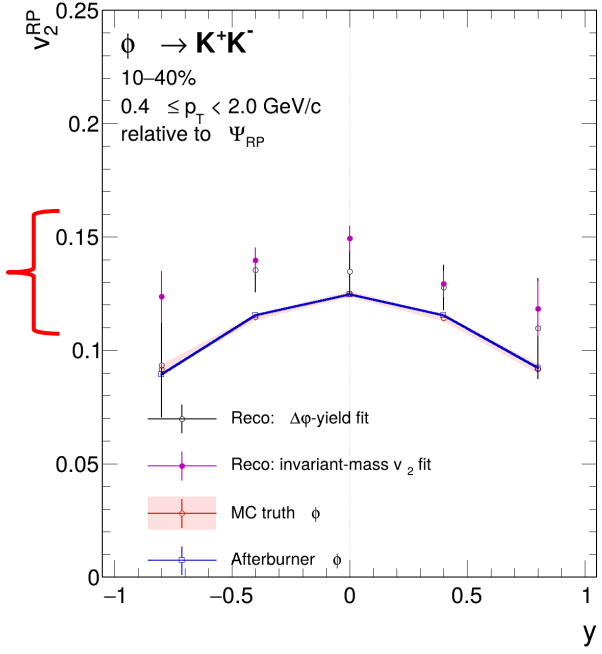


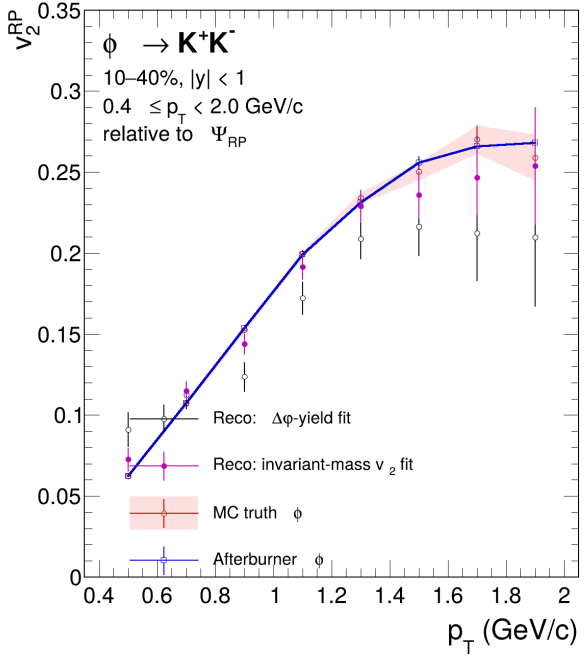
Selection criteria for true reco signal

- ***Same parent***
- Mother *PDG* = *333* (ϕ-meson)
- Daughter reco tracks $K^{+}K^{-}$ *PDG* = +-*321*
- Mother (ϕ-meson) has enhancement flag (-*9* and -*15*)

INCREASED by factor of 4: some kind of discrepancy

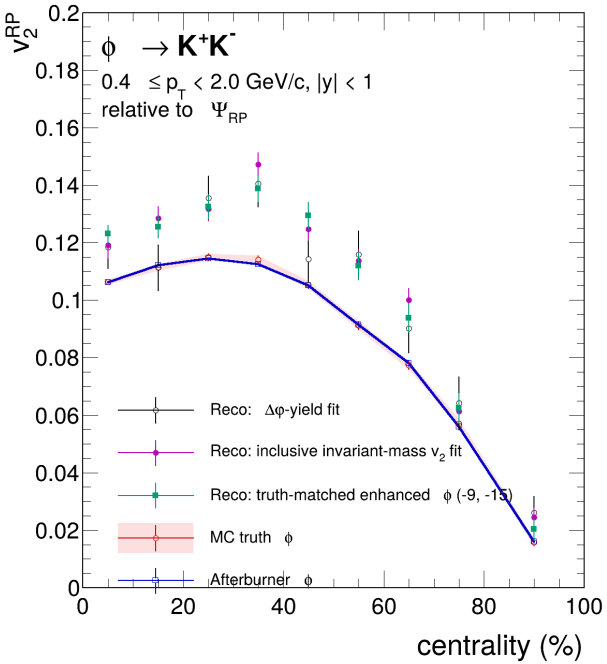


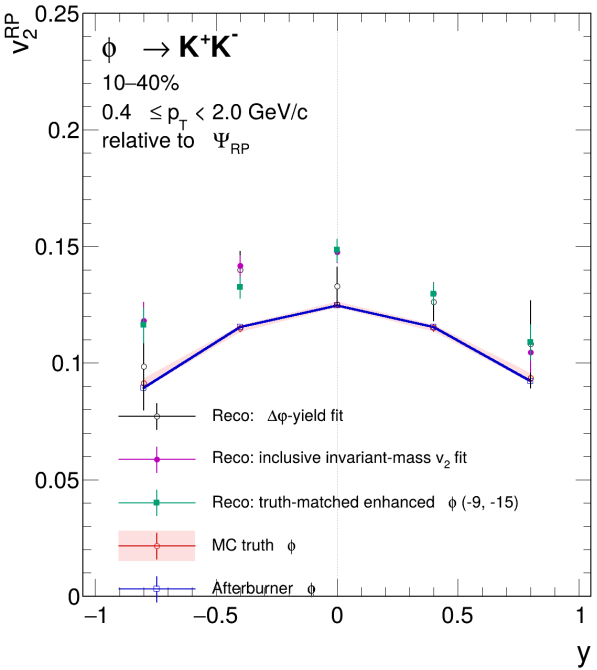


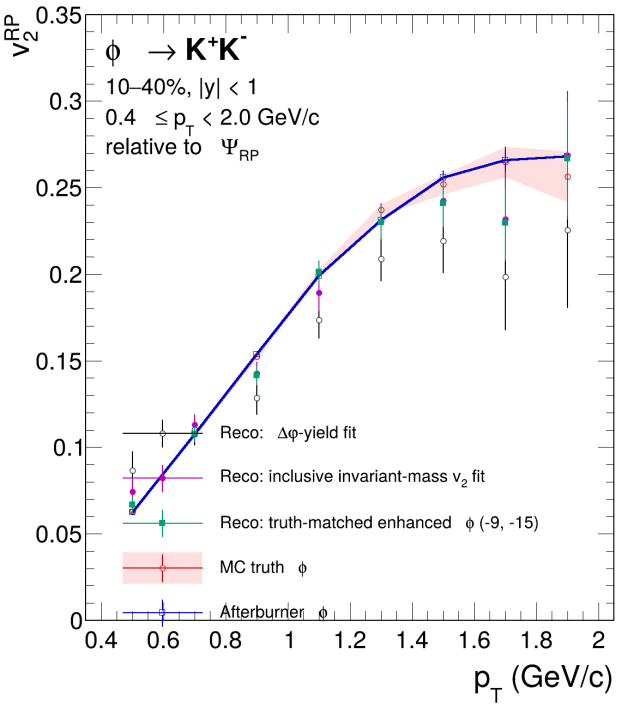


~ 100k events

INCREASED by factor of 4: true reco signal

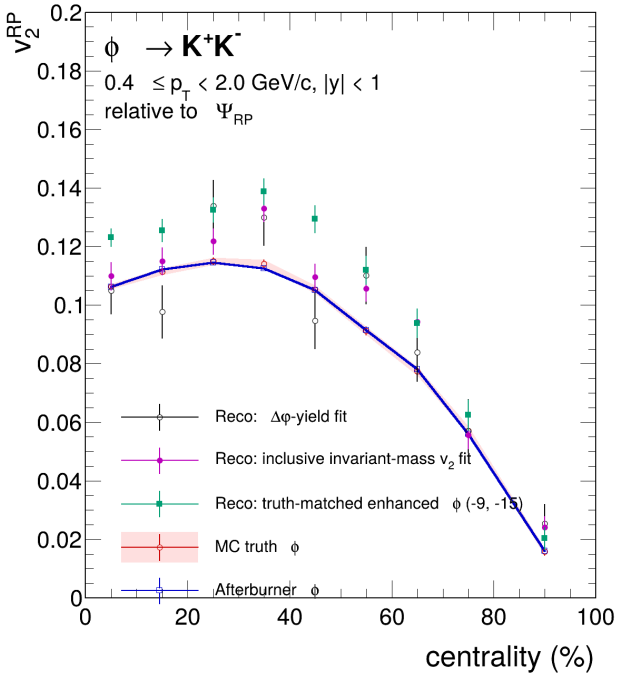


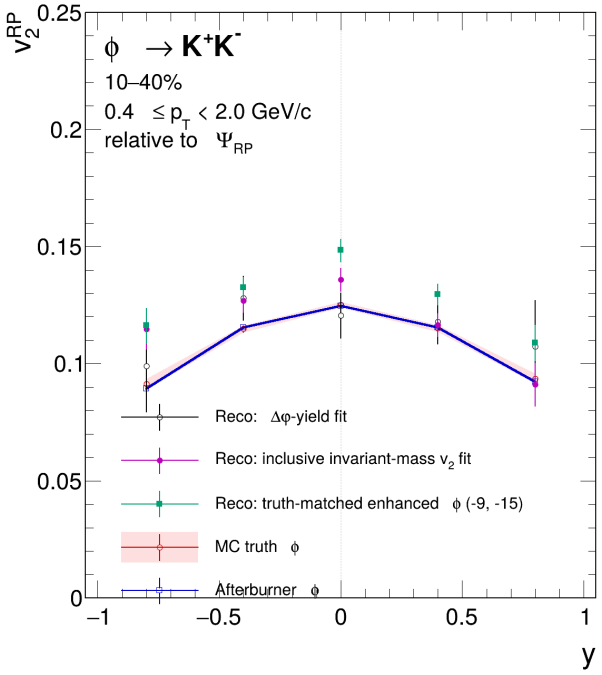


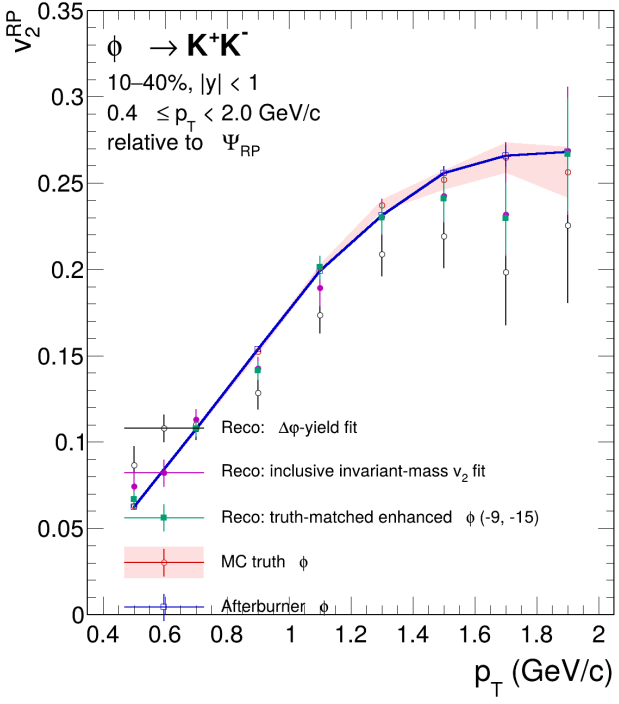


~ 95k events

INCREASED by factor of 4: correction on efficiency reco(pT) /true(pT)



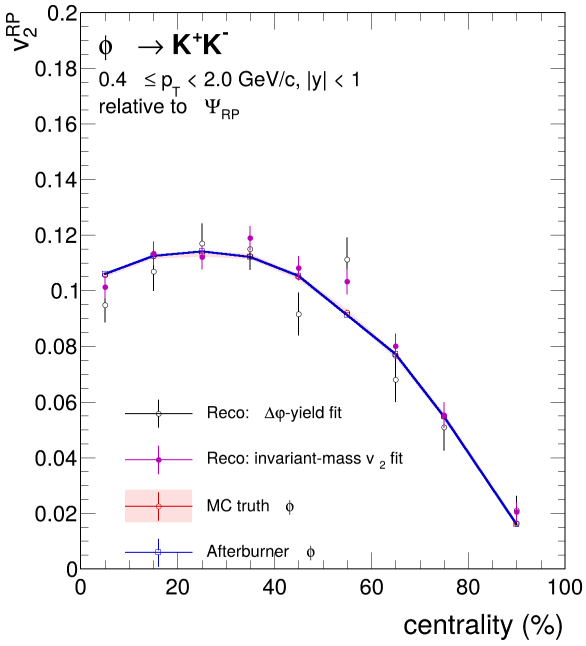


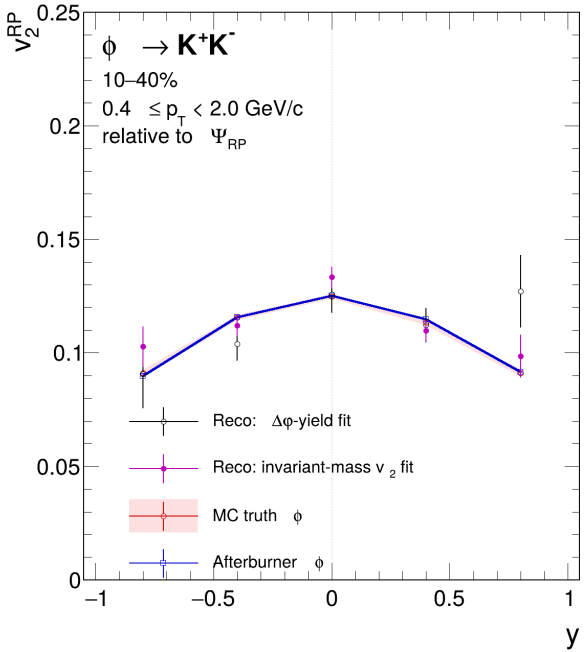


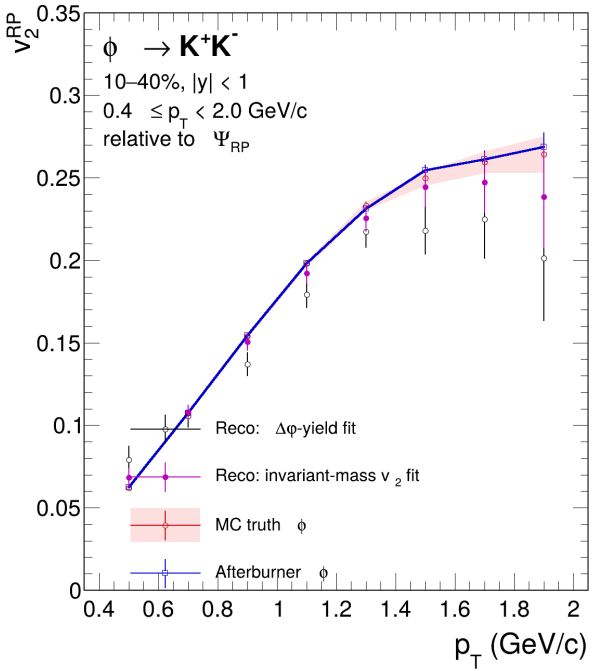
~ 95k events

More statistics and correction

INCREASED by factor of 4: More statistics and corrections

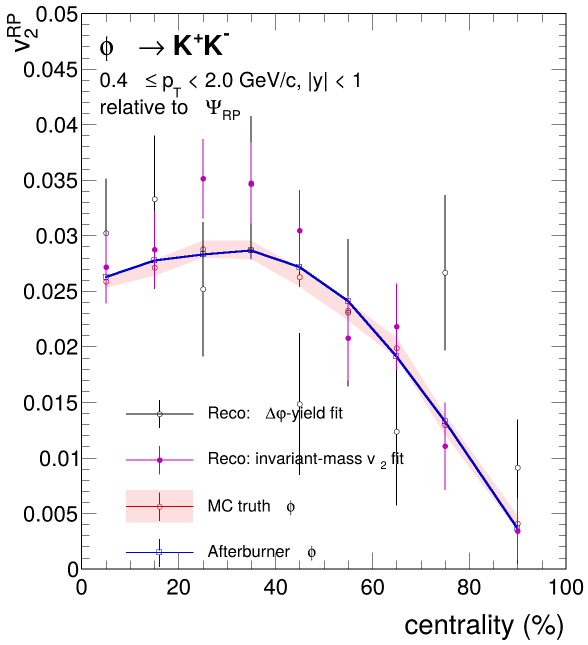


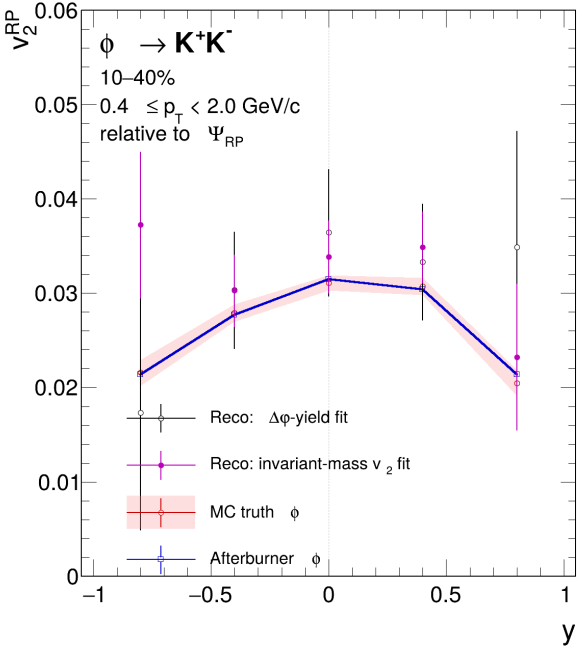


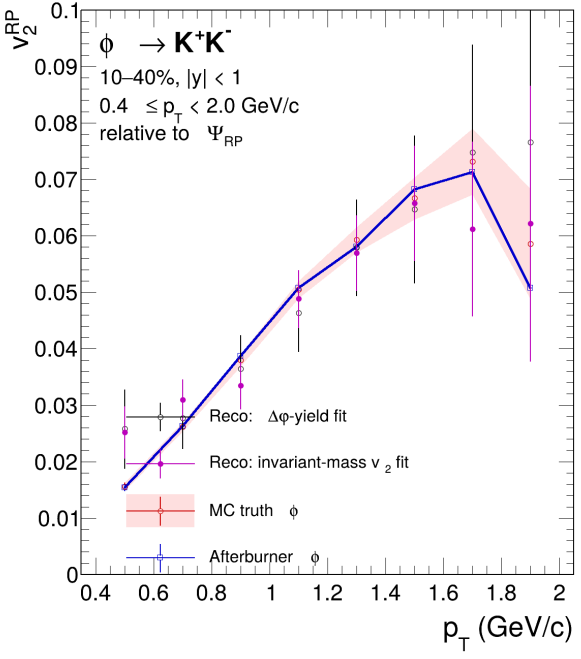


~ 150k events

REALISTIC: More statistics and corrections



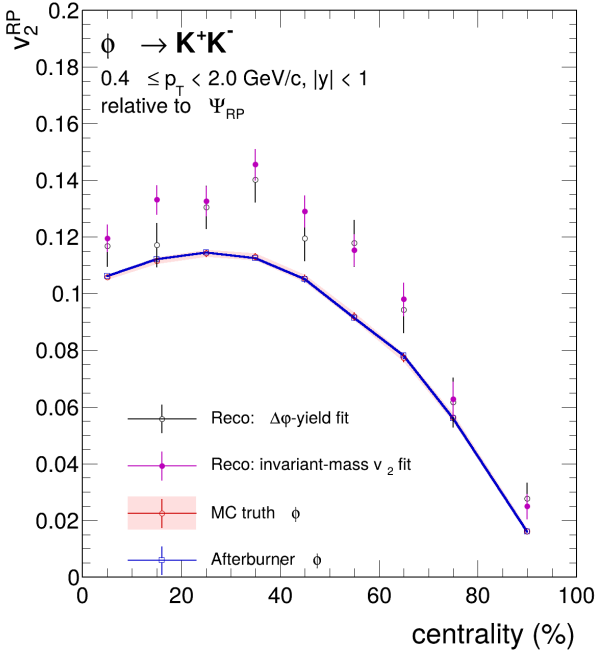


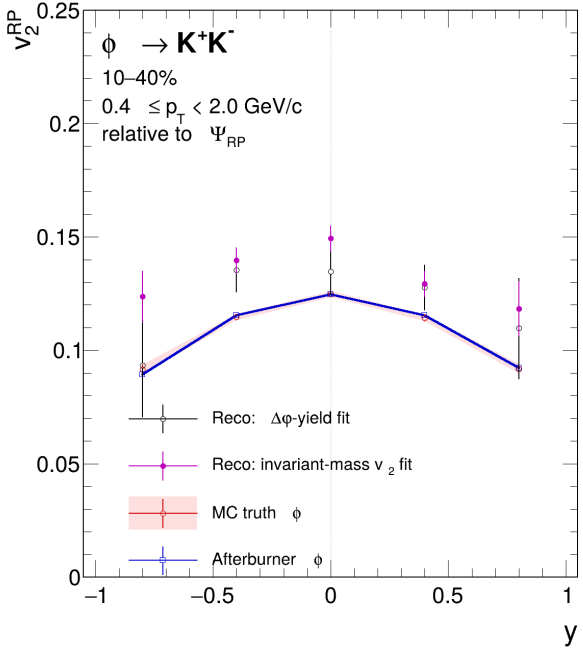


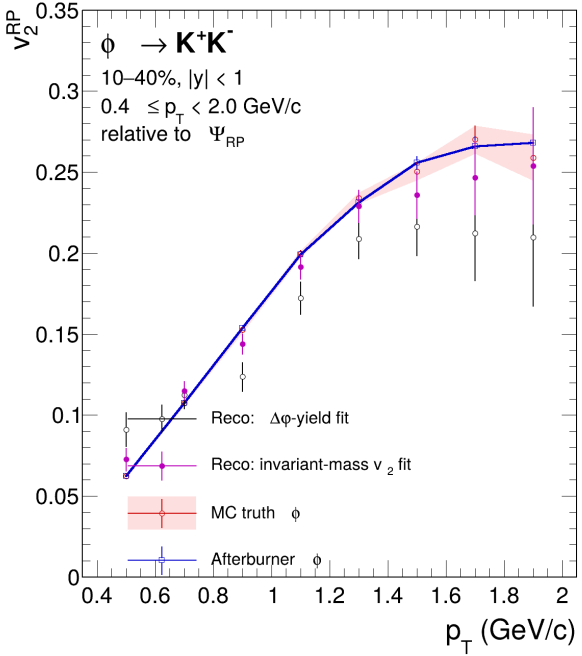
~ 250k events

OLD SLIDES

INCREASED by factor of 4: Elliptic flow relative to centrality rapidity, pT

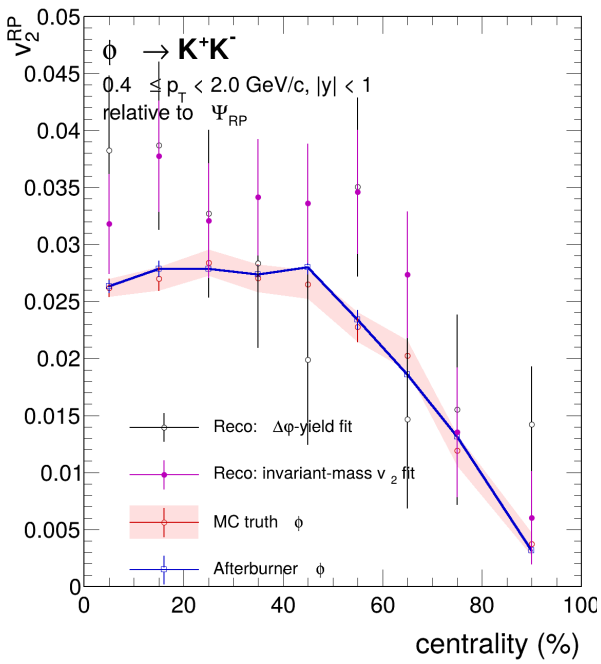


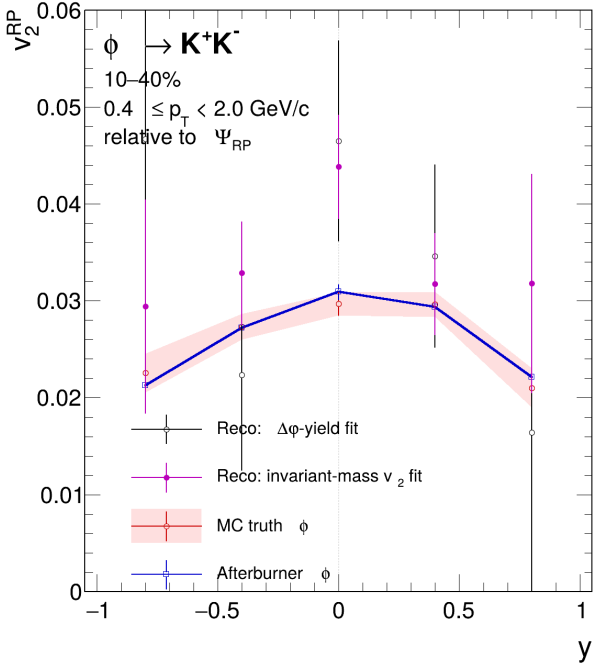


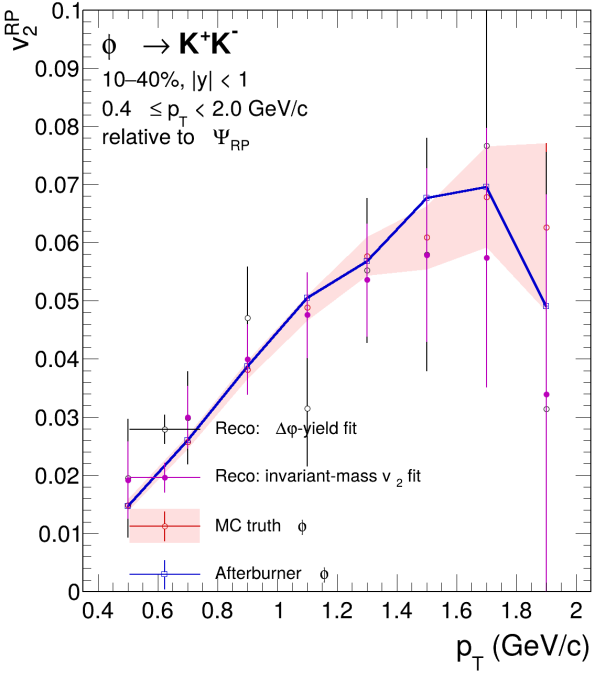


~ 100k events

REALISTIC: Elliptic flow relative to centrality rapidity, pT



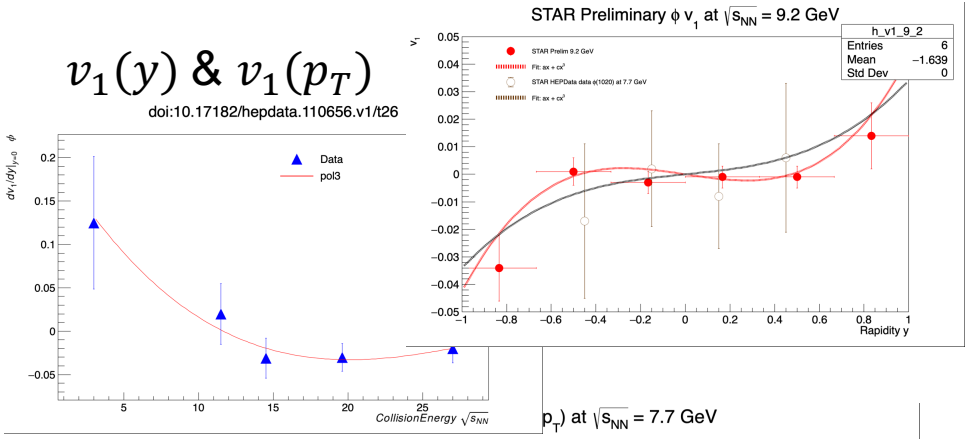


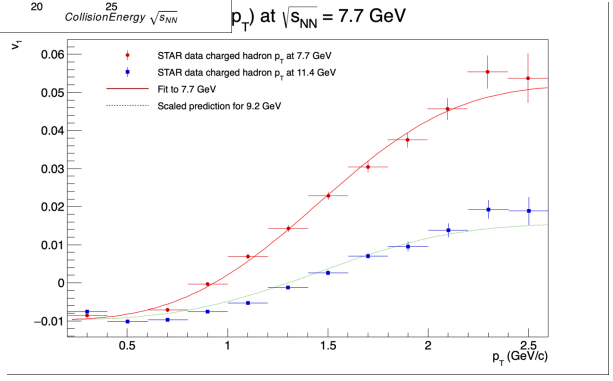


~ 120k events

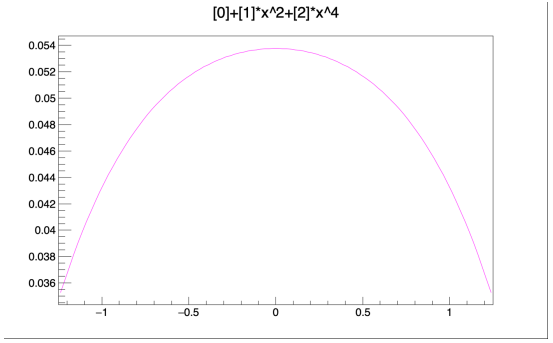
ϕ-meson v_1 and v_2 parameterization

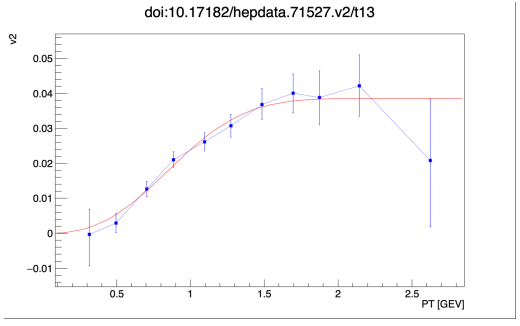
$v_1(y)$ & $v_1(p_T)$





$v_2(\eta)$ and $v_2(p_T)$ parametrized by data [3][4]





[3] arXiv:1206.5528 (Fig.8)
[4] arXiv:1509.08397v2

Previous measurement at the prod. 25

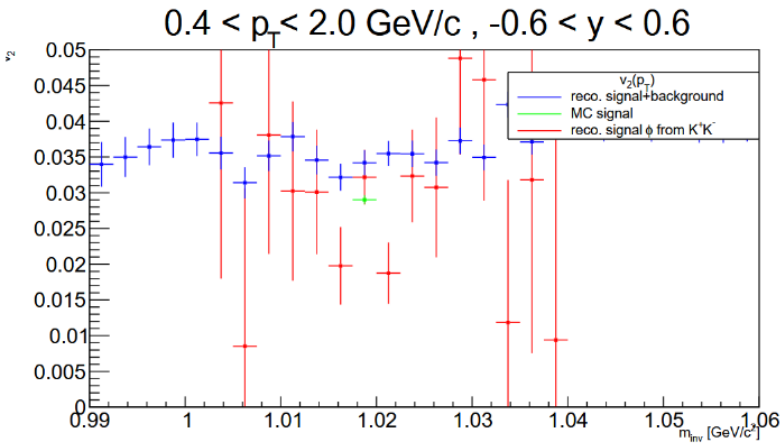
Used cuts:

Event selection: vertex z coordinate < *130*

Track selection:

- Kaons identification within 2σ
- $N_{hits} > 24$
- $p_T > 0.1$ GeV/c
- |DCA| < 2σ
- Kaon pair $|y_{K^+K^-}| < -0.6$

Signal v_2 and background v_2 are similar – *can not distinguish between them very well*.



Previous measurement at the prod. 25

- (Reco full) reconstructed data (with background subtraction);
- (Reco signal)
  Δϕ method for reconstructed data:
  pdg = 321(K+) and -321(K-)
  mother particle pdg = 333 (phi meson);
- **(True)** Monte Carlo data;
  mother particle pdg = 333 (phi meson);

