$\gamma + p \to p + \eta\prime \to p + \pi^+\pi^-\pi^0\pi^0\pi^0$

Benedikt Zihlmann

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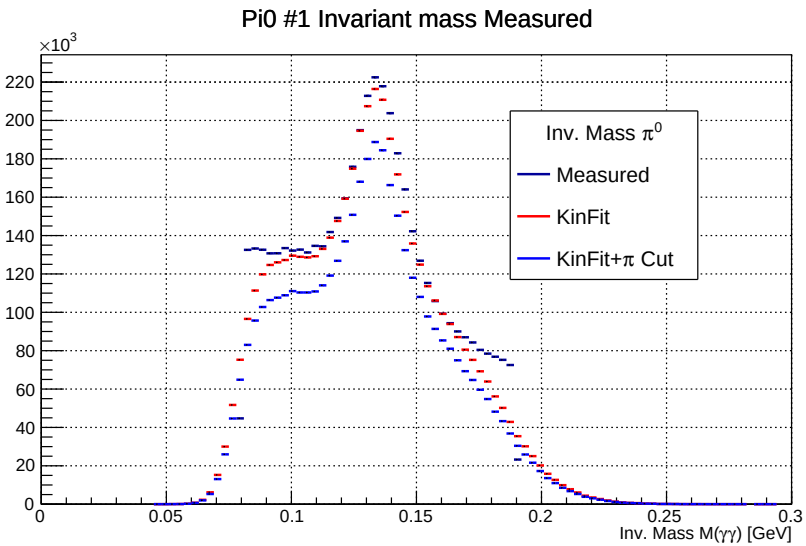
Analysis Cuts

$\gamma + p \rightarrow p + \eta\prime \rightarrow p + \pi^+\pi^-\pi^0\pi^0\pi^0 \rightarrow p + \pi^+\pi^- 6\gamma$
trees: /cache/halld/RunPeriod-2018-08/analysis/ver06/tree_pi0pi0pi0pippim__B4_M7/

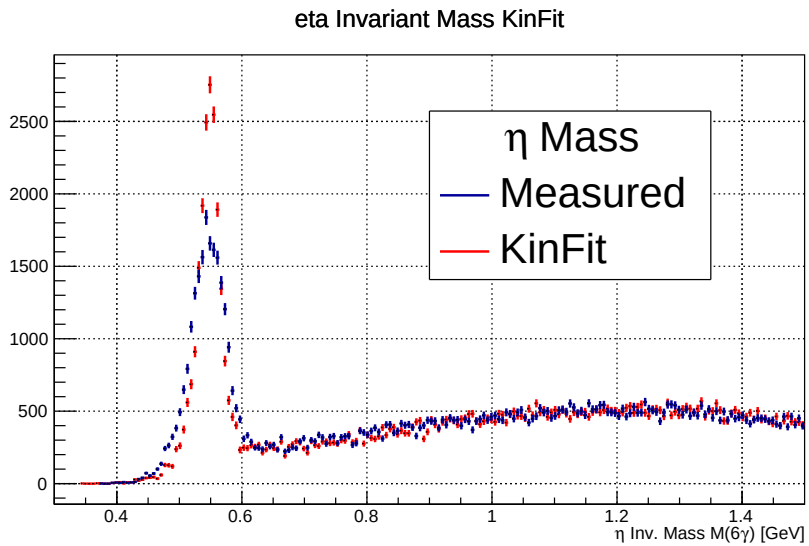
1. 8.0 GeV $< E_{beam} <$9.0 GeV
2. $\chi^2/NDF < 6.$
3. QF$>$ 0.5 for all 6 photons
4. Exactly 6γ in FS
5. M(pπ^+)<1.35 GeV
6. N_{π^0}>2 ($m_{\pi^0} = 0.135 \pm 0.03$ GeV)
7. $m_\eta = 0.5478 \pm 0.05$ GeV (2.5σ)
8. MM $= 0 \pm 0.5$

π^0 and η Mass

π^0 Meas. and KinFit (c. 1-4)

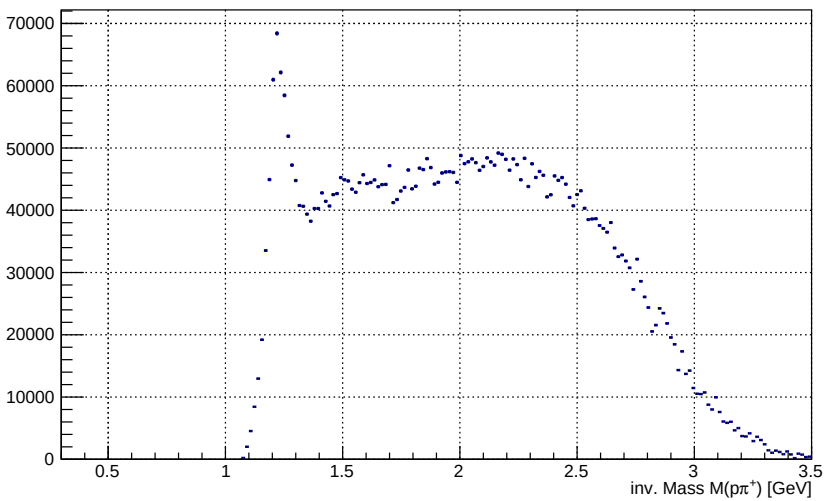


η Inv. Mass (c. 1-6)

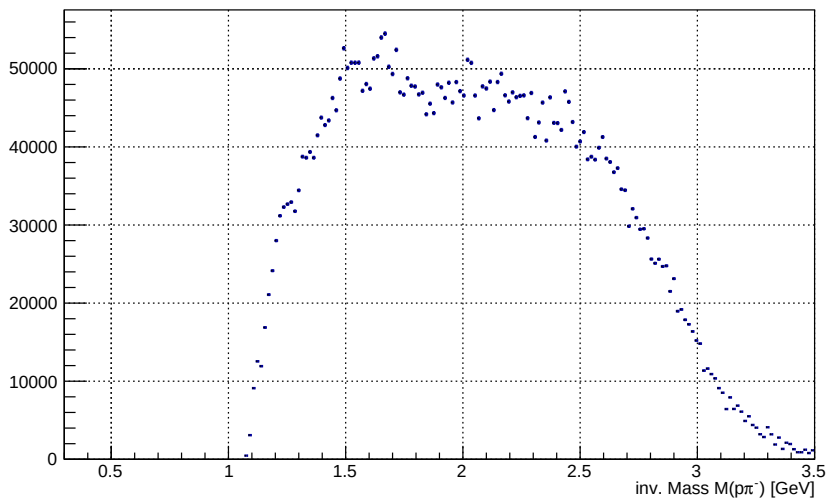


Barions

$p\pi^+$ Mass

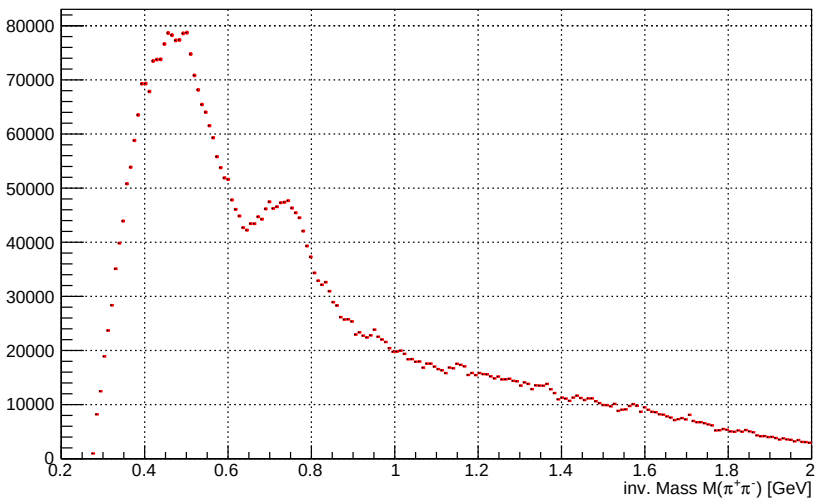


$p\pi^-$ Mass

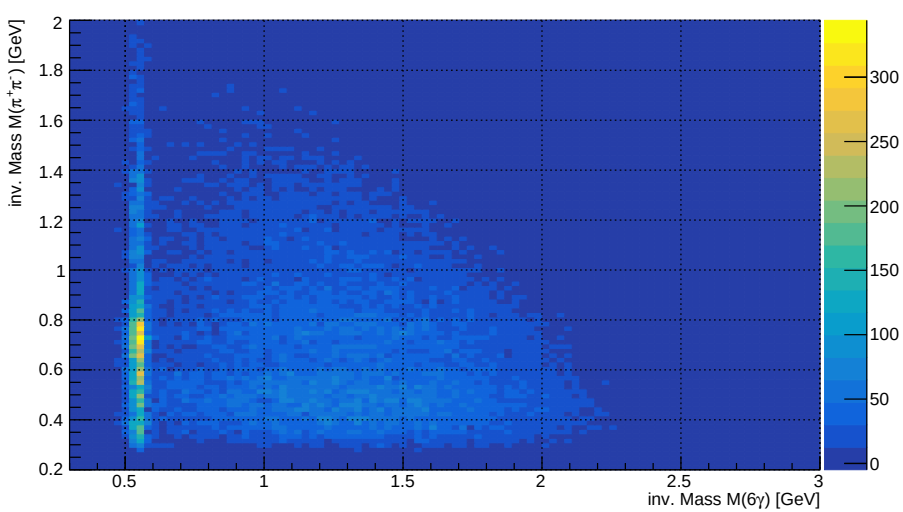


ρ in the data

$\pi^+\pi^-$ Mass

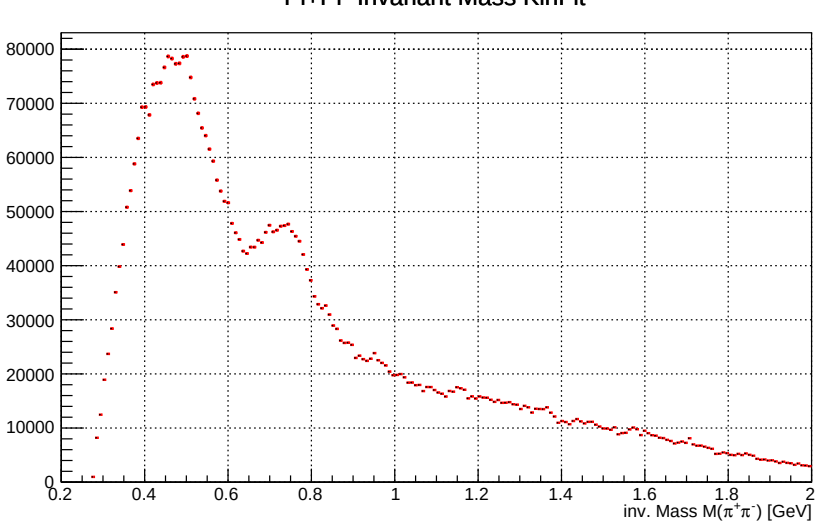


$\pi^+\pi^-$ Mass vs η



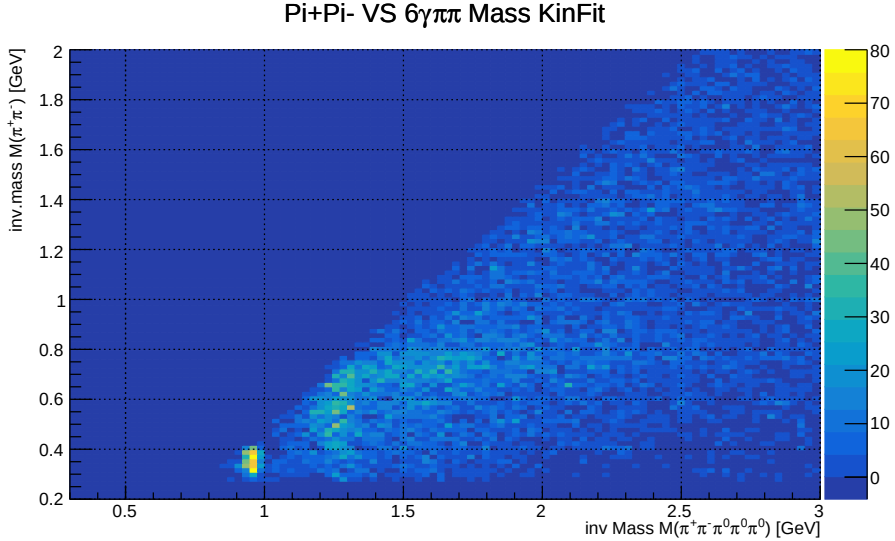
ρ in the data

$\pi^+\pi^-$ Mass

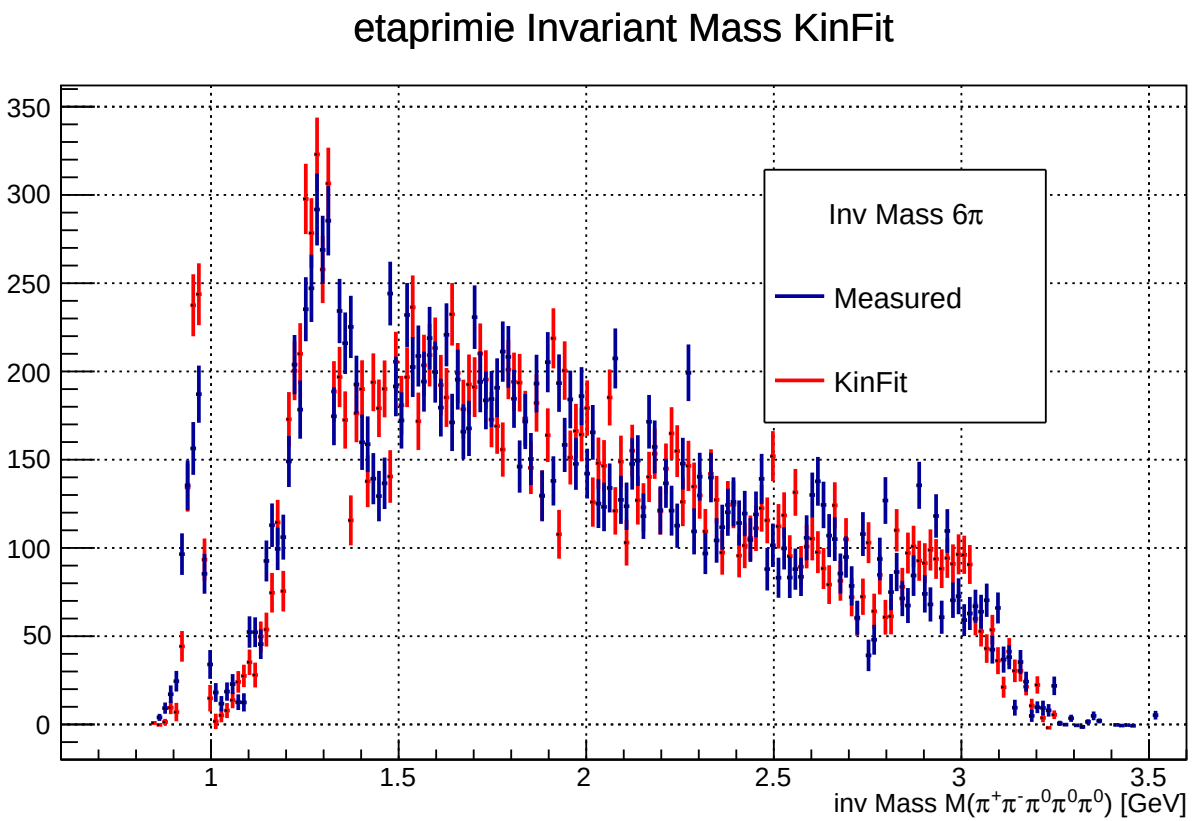


NO ρ in $\eta\prime$

$\pi^+\pi^-$ Mass vs $\eta\prime$

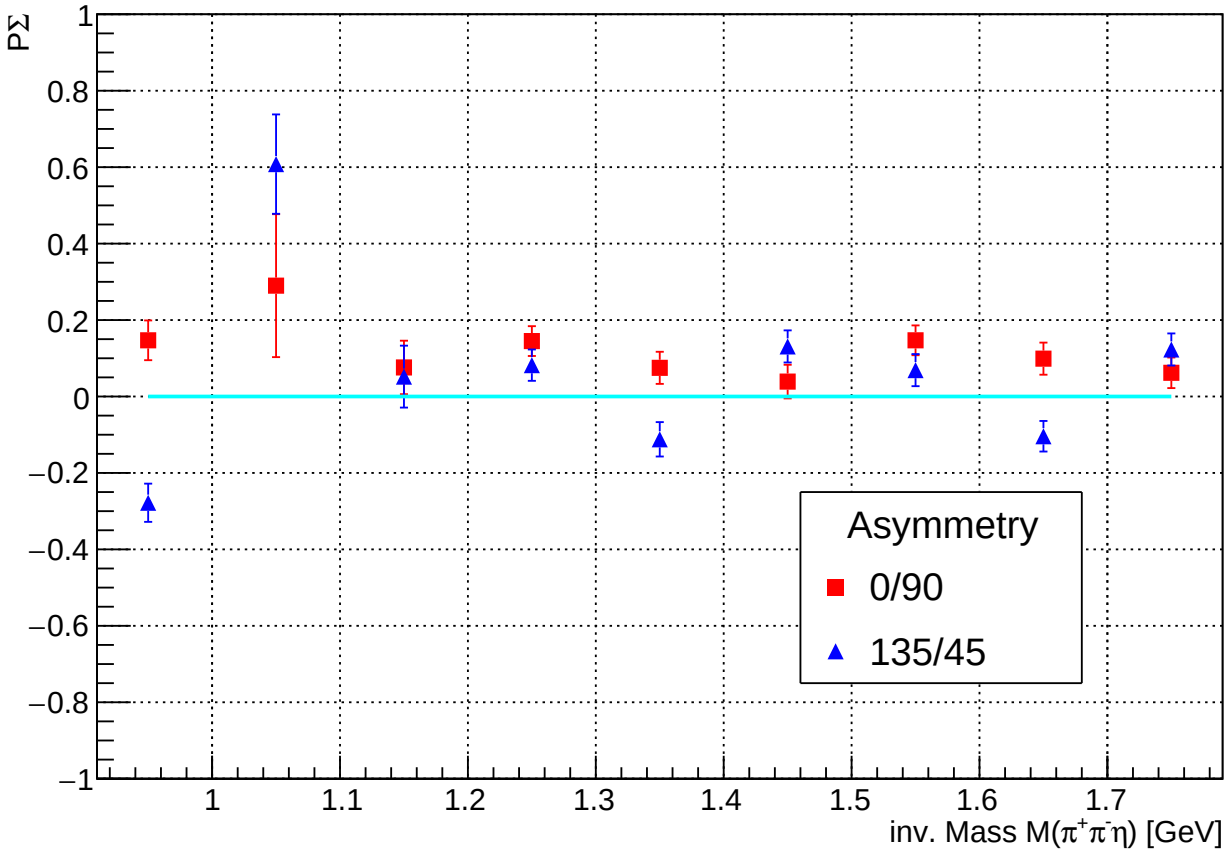


$\eta\prime$ inv. Mass



small background!

Beam Asymmetry $P\Sigma$

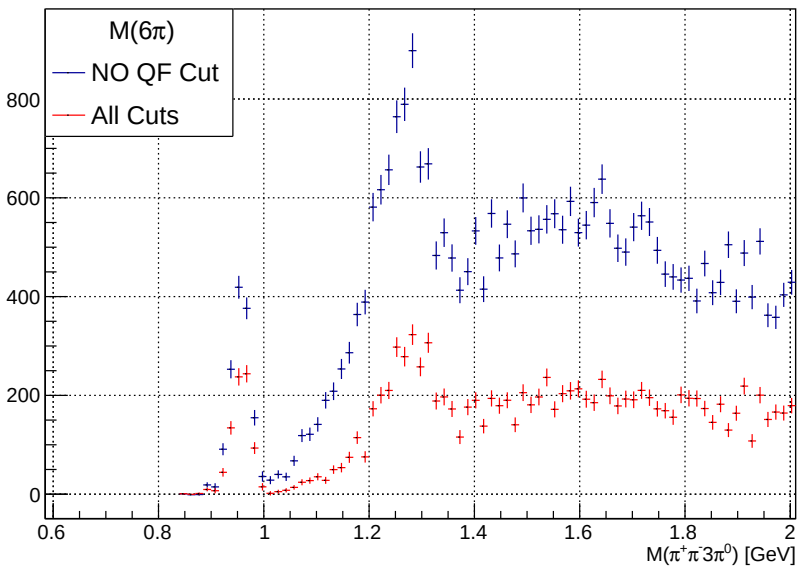


- $\sim$ 30% of Fall18 data
- QF and Δ^{++} cut not needed
  double yield, minimal backgr.?

QF and Δ^{++} Cuts

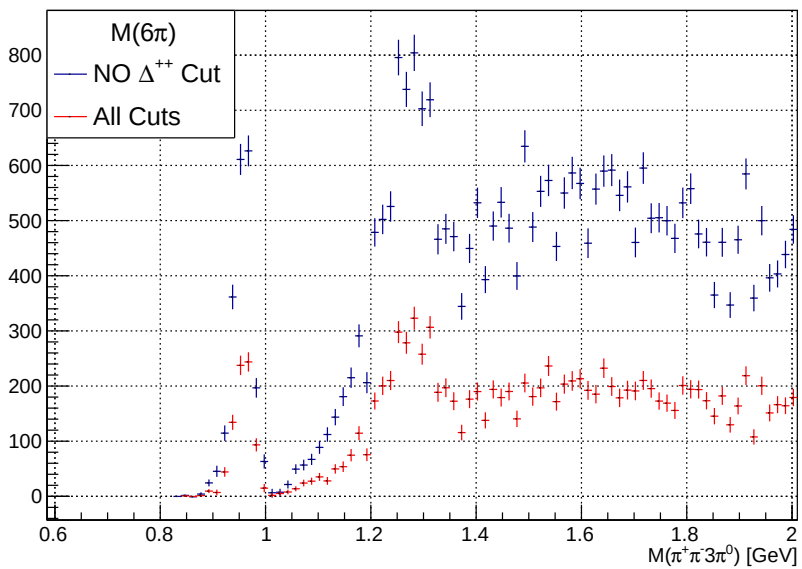
QF cut

FS=6γ



Δ^{++} cut

FS=6γ



YES: QF and Δ^{++} do not affect $\eta\prime$ much.

η cut

Even cut on the η inv. mass only affects masses above the $\eta\prime$.