

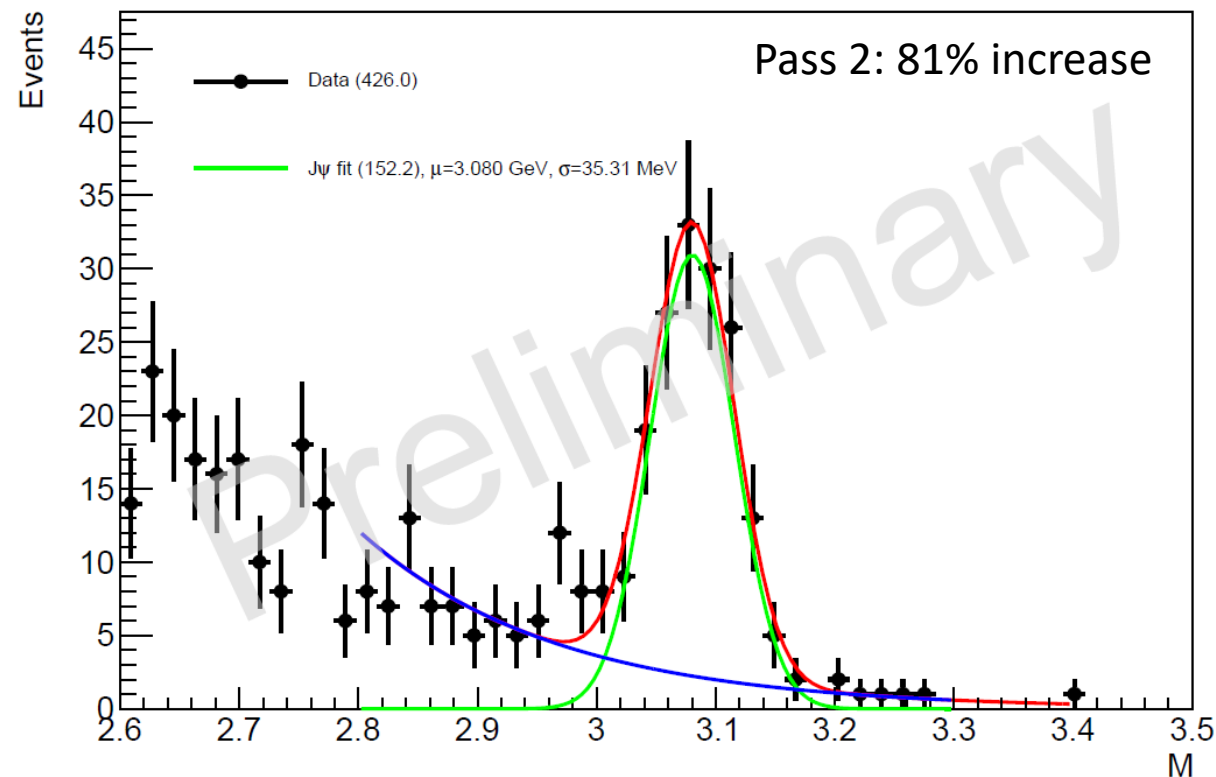
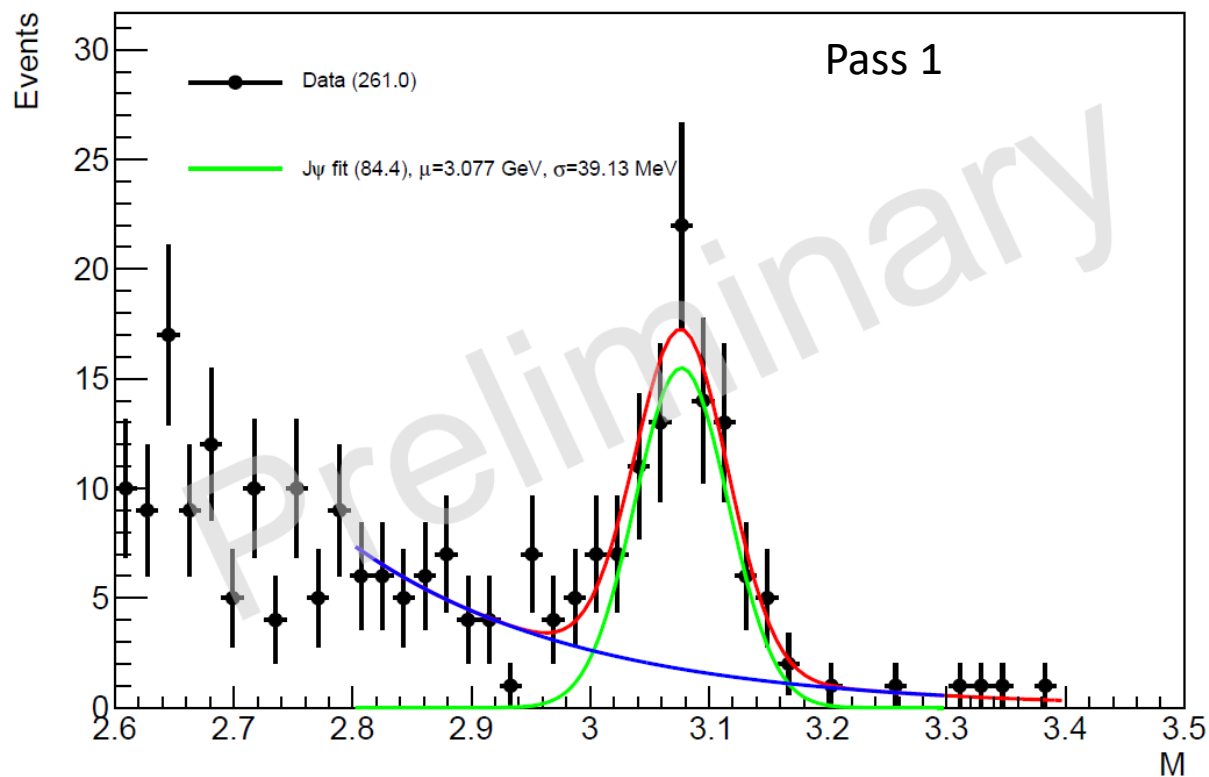
Dilepton analysis update

6th of September 2023

- 1- Pass 1 / Pass 2 comparison for the electron/positron final state on proton target
- 2- Short-term goals
- 3- One to two years strategy

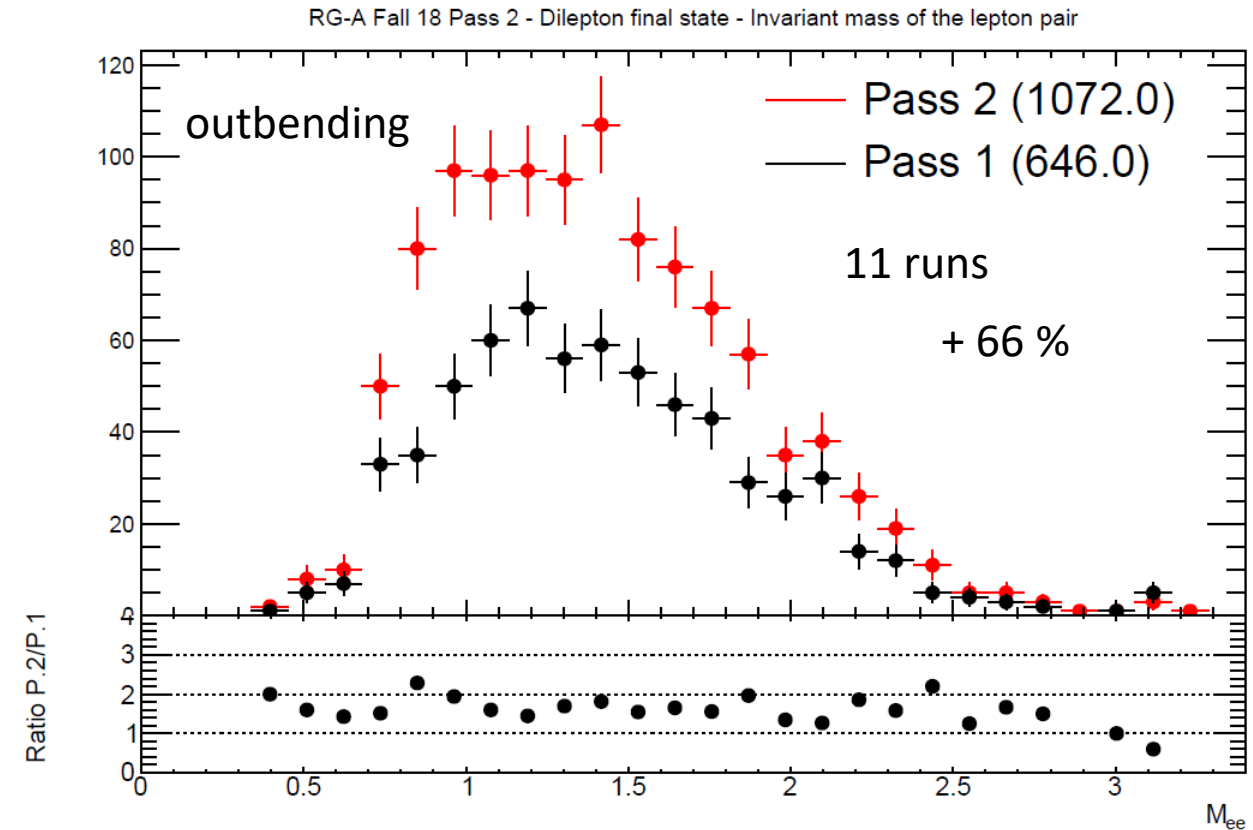
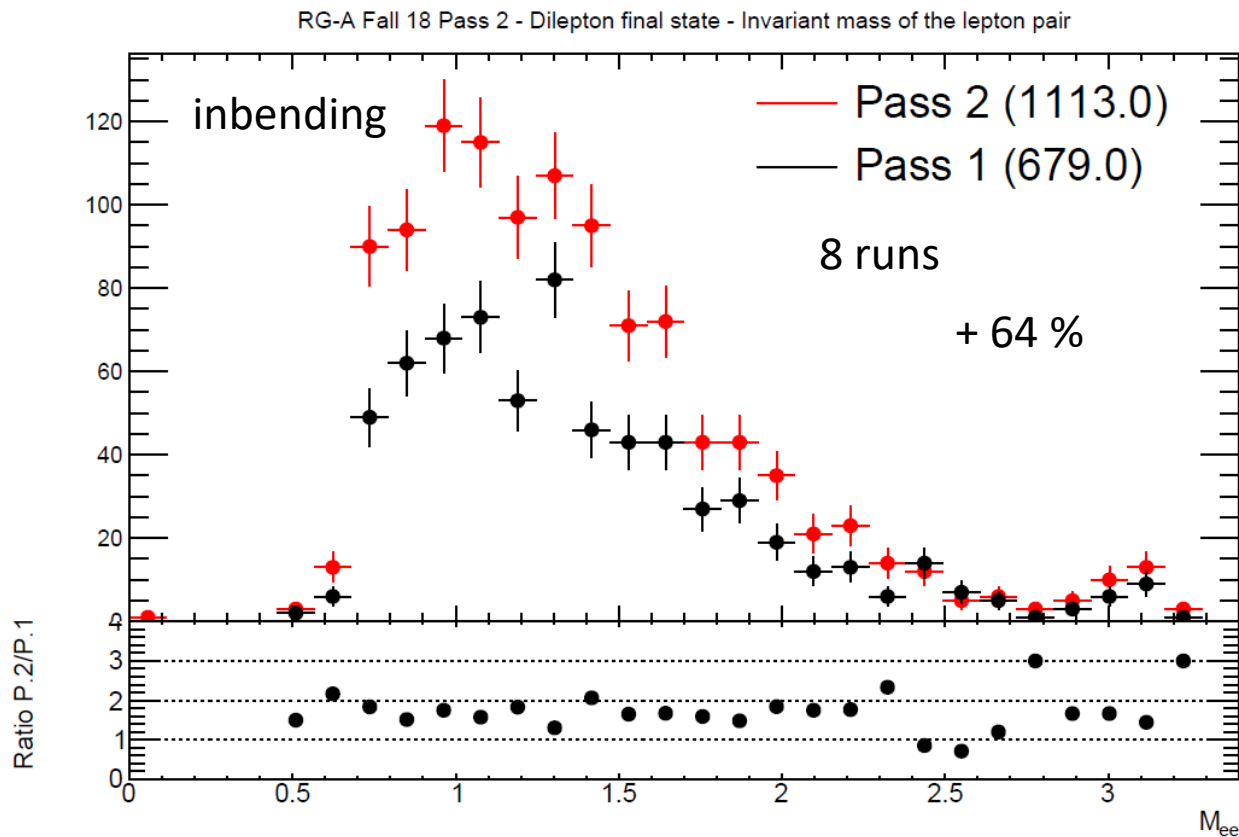
1 - Pass 1 VS Pass 2 comparison: Spring 2019

- Event topology: exactly one electron, exactly one positron, exactly one proton, anything else
- Lepton momenta > 1.7 GeV, Sampling Fraction > 0.15 Lepton AI PID score > 0.05 (trained on pass1 simulation)
- Exclusivity cuts: $|MM^2| < 0.4$ GeV² and $|Q^2| < 0.1$ GeV²



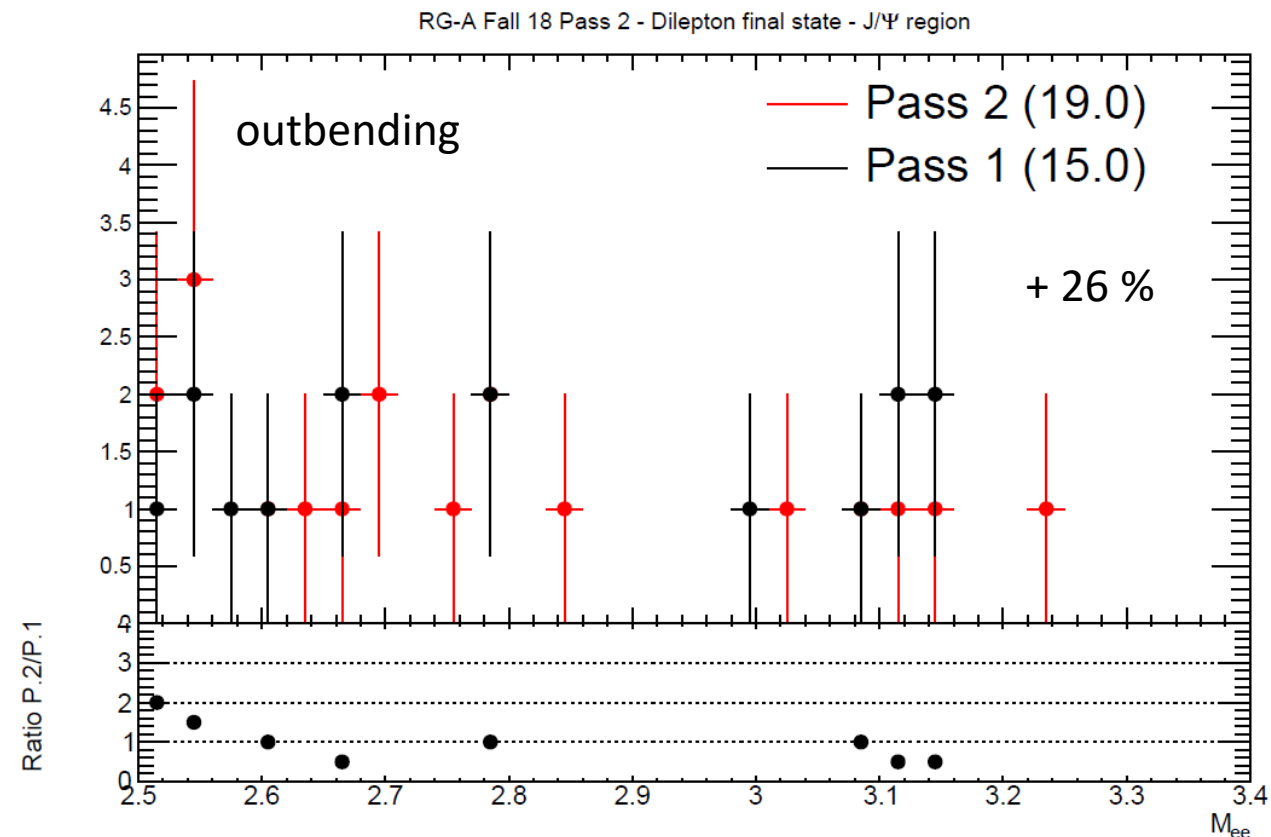
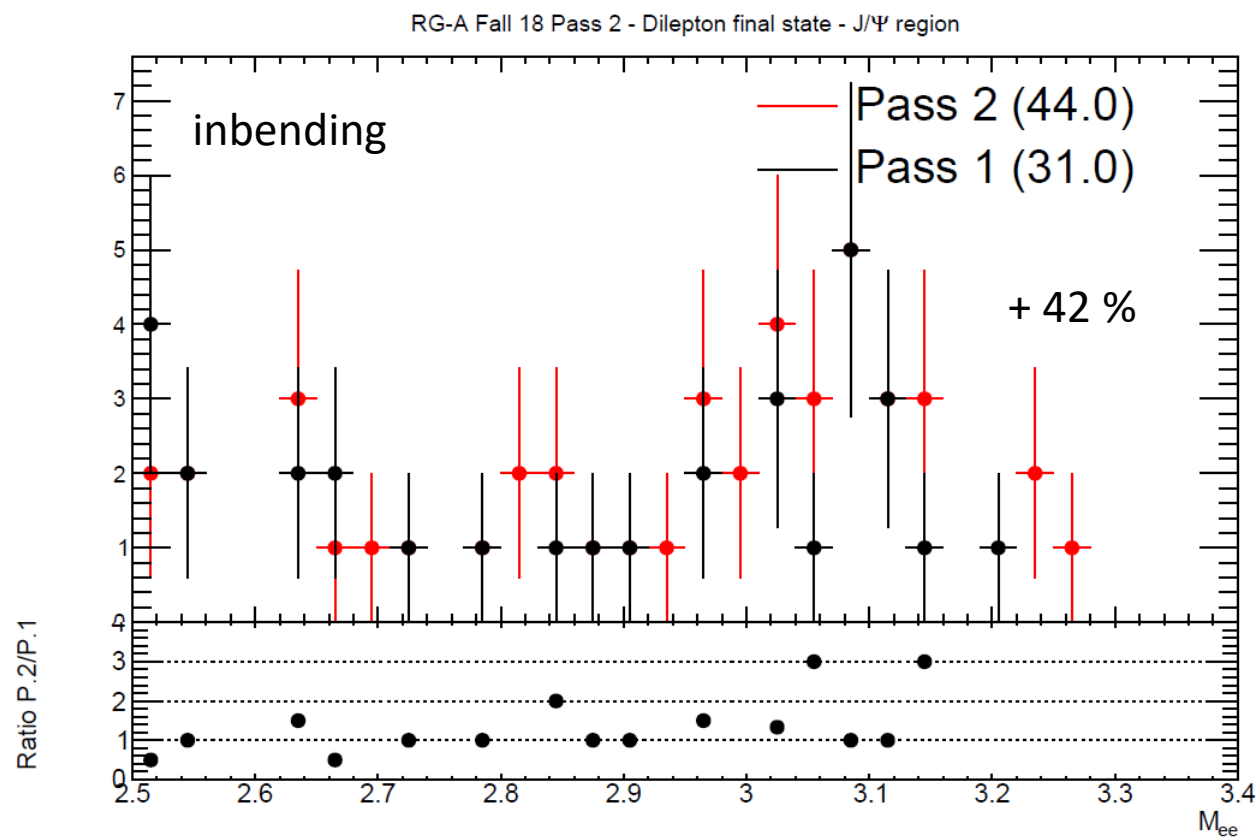
1- Pass 1 VS Pass 2 comparison: Fall 2019

- Event topology: exactly one electron, exactly one positron, exactly one proton, anything else
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1- Pass 1 VS Pass 2 comparison: Fall 2019

J/Psi mass region



2 – Short-term goals (next few months)

Jpsi photoproduction in Electron/Positron final state (+ TCS)

- Radiative corrections are well advanced. Currently exchanging with article authors (M. Vanderhaeghen) to validate the approach
- Electron/Positron AI PID to be redone using Pass 2 simulation (few days)
- Full scale simulations (typically need few days on OSG for 10M events)
- Same-charge lepton background correction to be re-derived with pass 2 data (1 day)

Missing ingredients: Momentum corrections, MC smearing

Jpsi photoproduction in Muon final state

- AI PID to be redone using Pass 2 simulation

3 – One to two years strategy

1 – Near threshold photoproduction of Jpsi on proton

Observables : Cross section as a function of E_γ and $-t$

Dataset: RGA F18 (in and out) + S19

Manpower: Richard (Muons), Mariana and Pierre (Electrons)

Combination electron/muon to be considered

2 – Timelike Compton scattering

Observables: A_{FB} , BSA, cross-section

Dataset: RGA F18 (in and out) + S19

Manpower: Pierre

3- Tagged Jpsi photoproduction

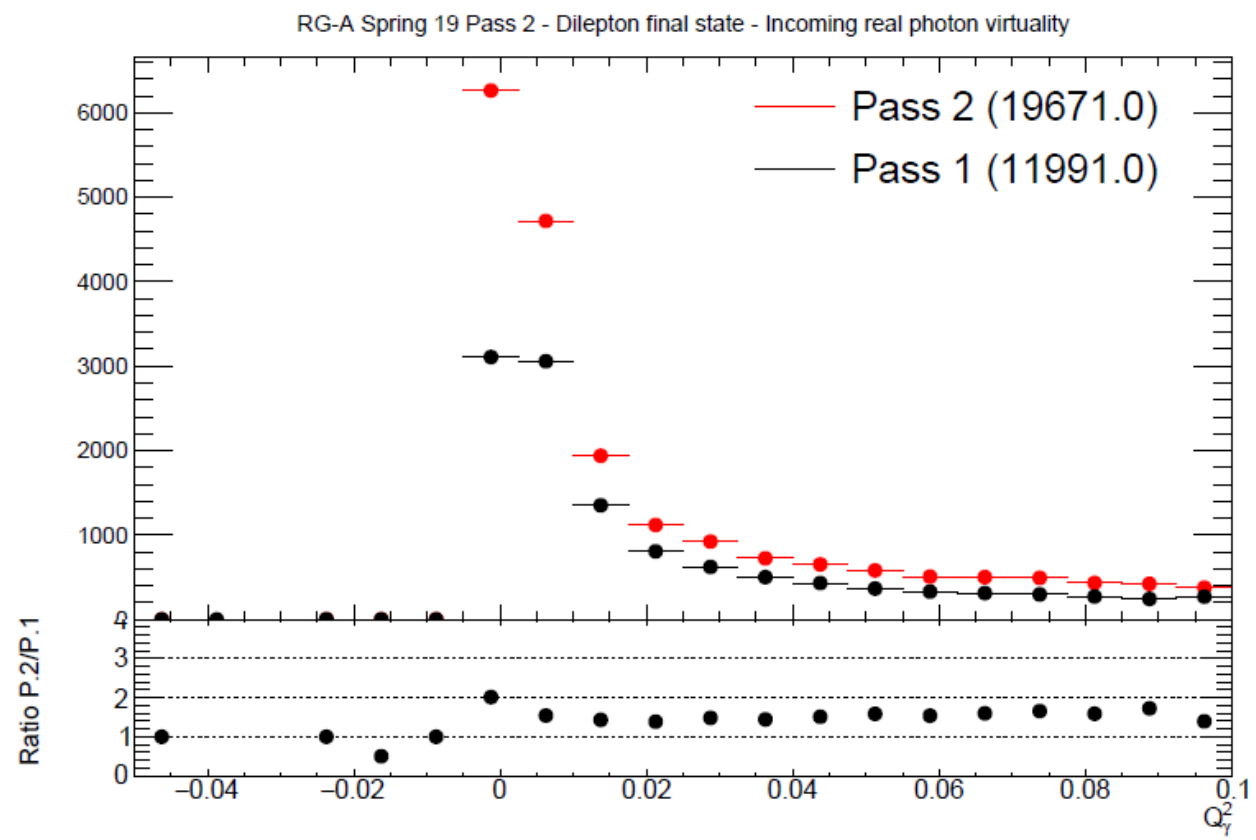
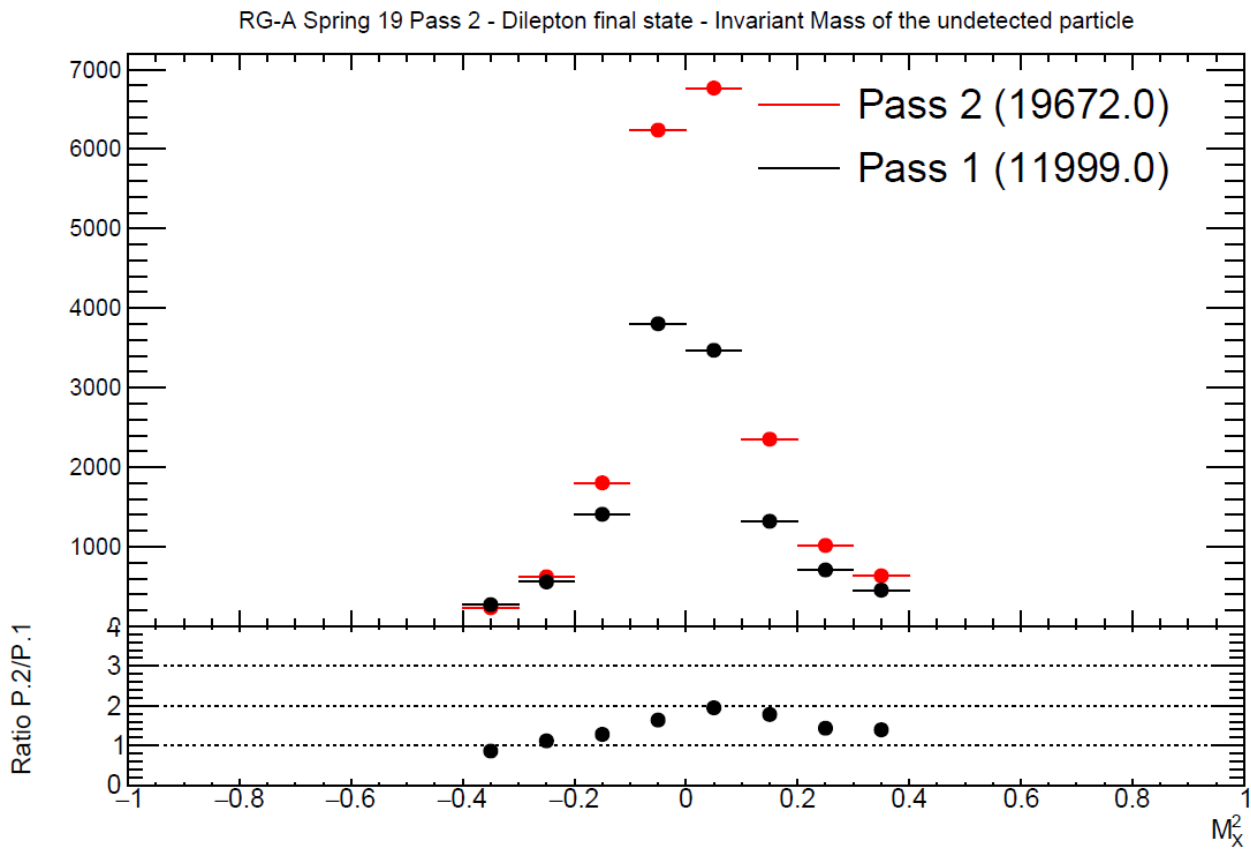
Channels: $ep \rightarrow e'e^+e^-X$, $ep \rightarrow e'pe^-$ and $ep \rightarrow e'pe^+$

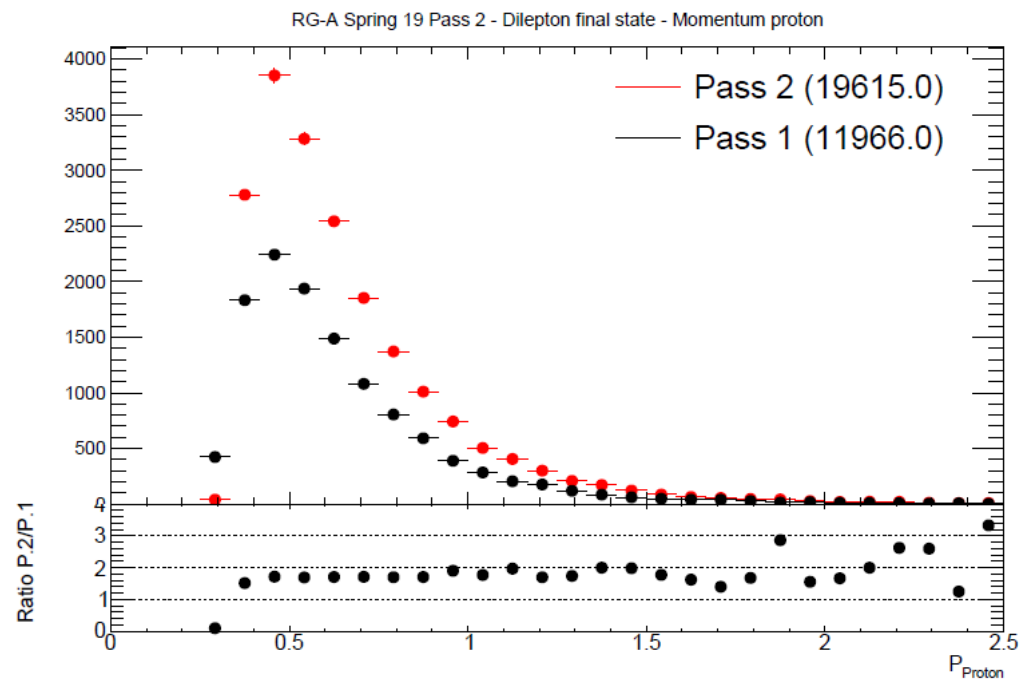
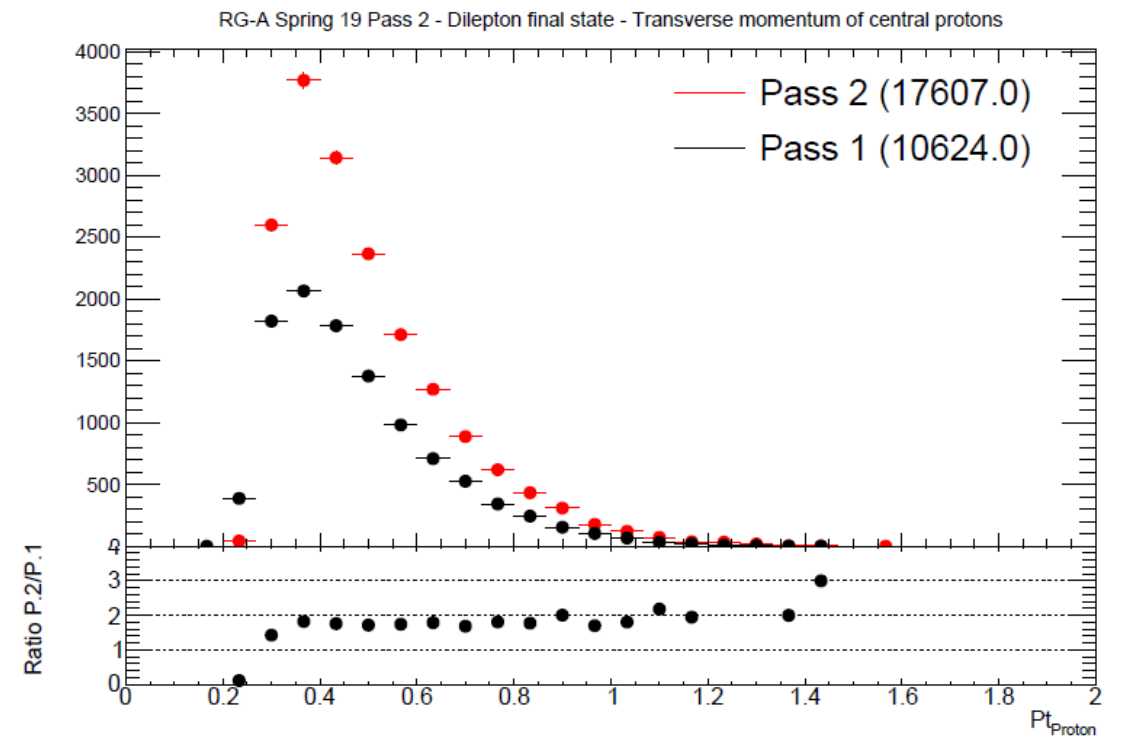
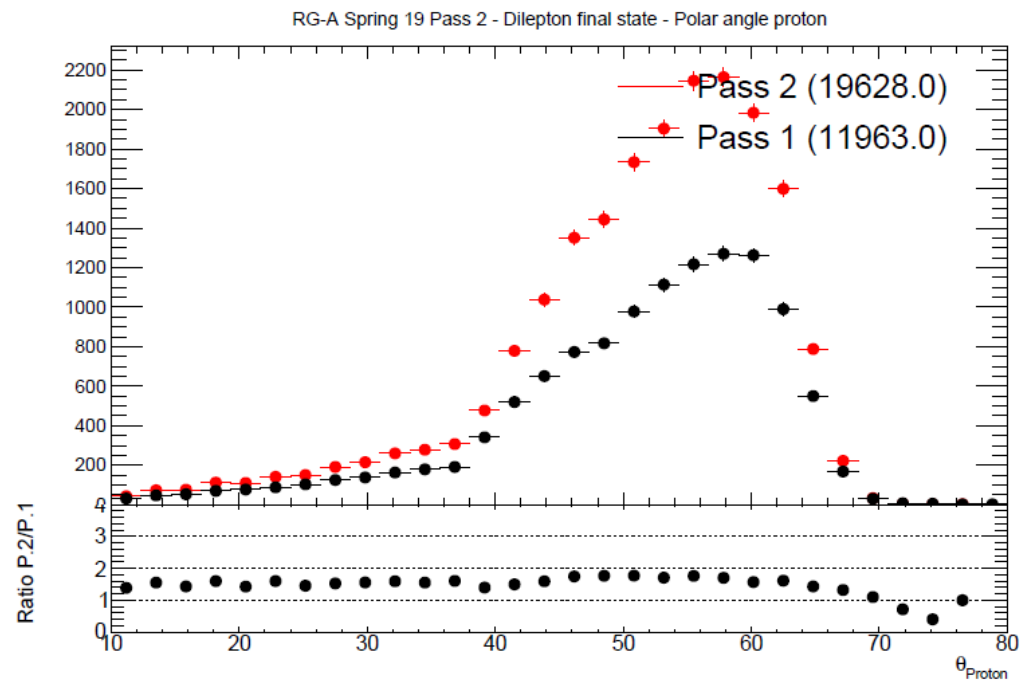
Dataset: RGA F18 (in and out) + S19

Manpower: Mariana

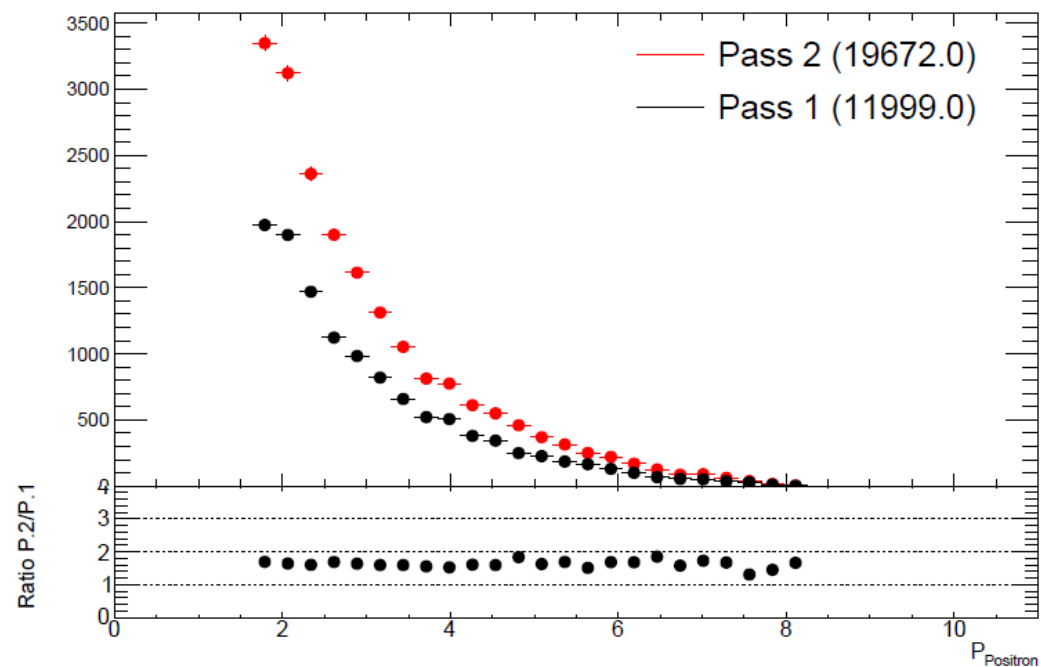
Back-ups

Spring 2019

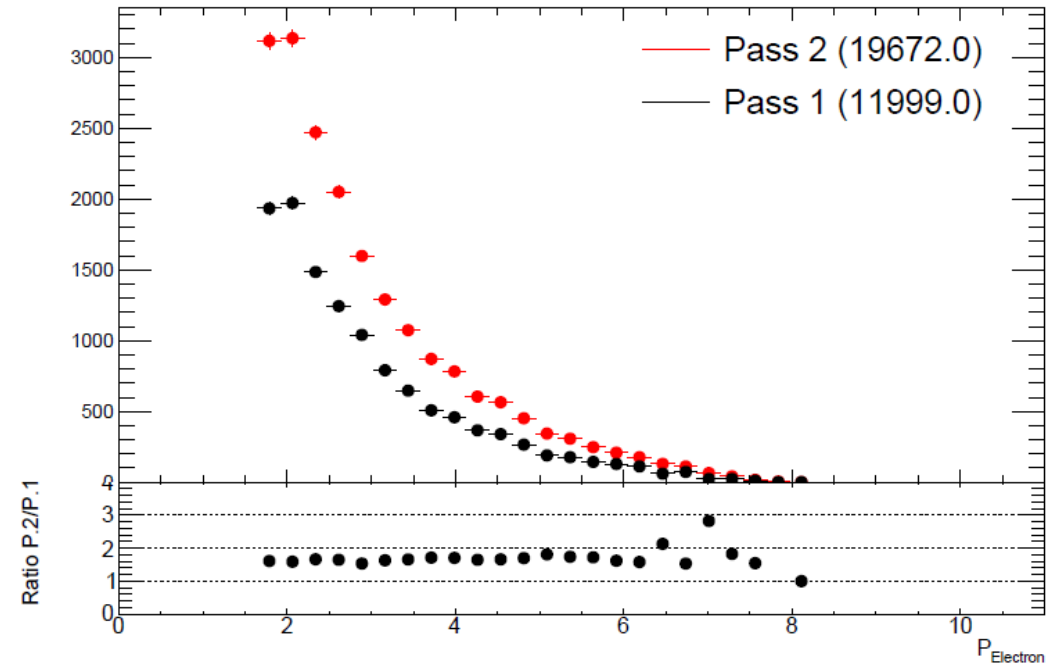




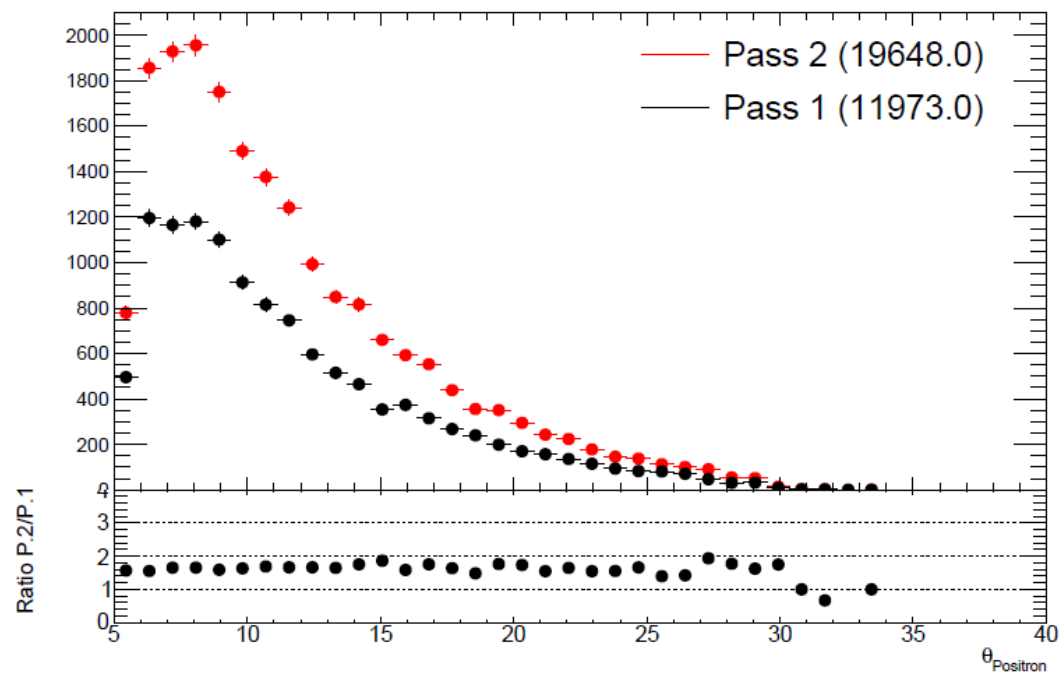
RG-A Spring 19 Pass 2 - Dilepton final state - Momentum positron



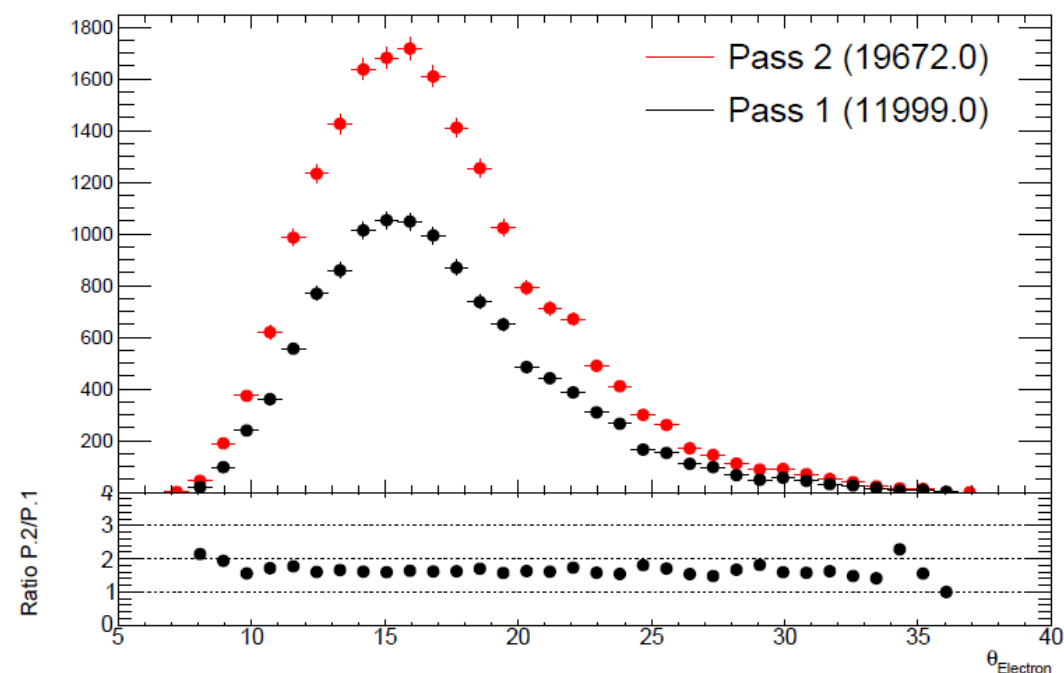
RG-A Spring 19 Pass 2 - Dilepton final state - Momentum electron



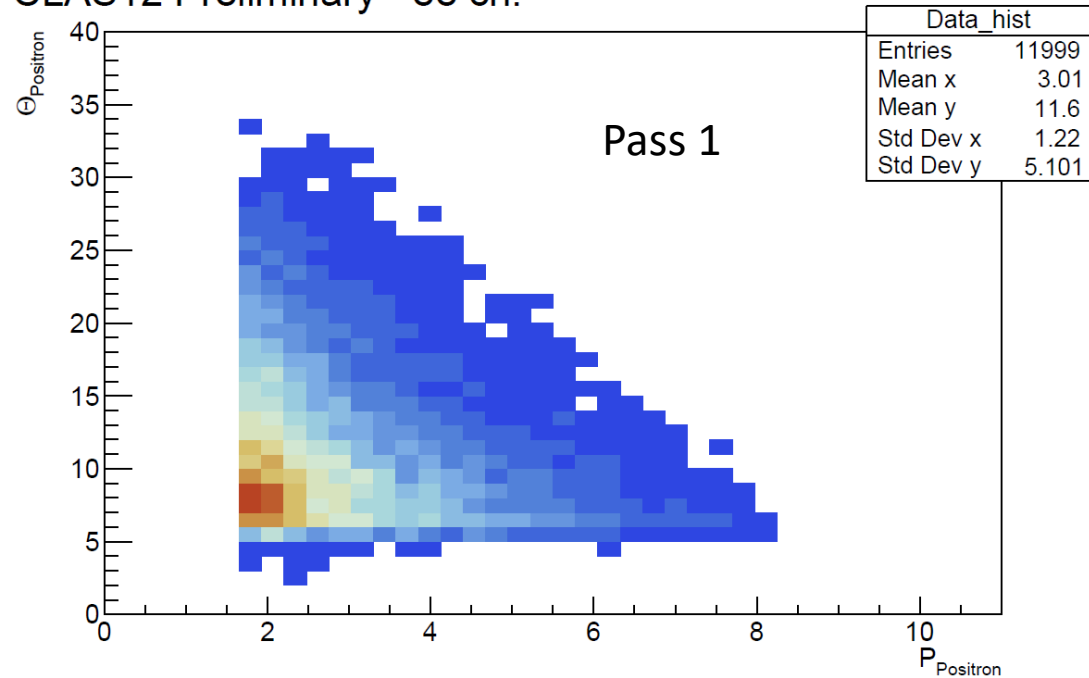
RG-A Spring 19 Pass 2 - Dilepton final state - Polar angle positron



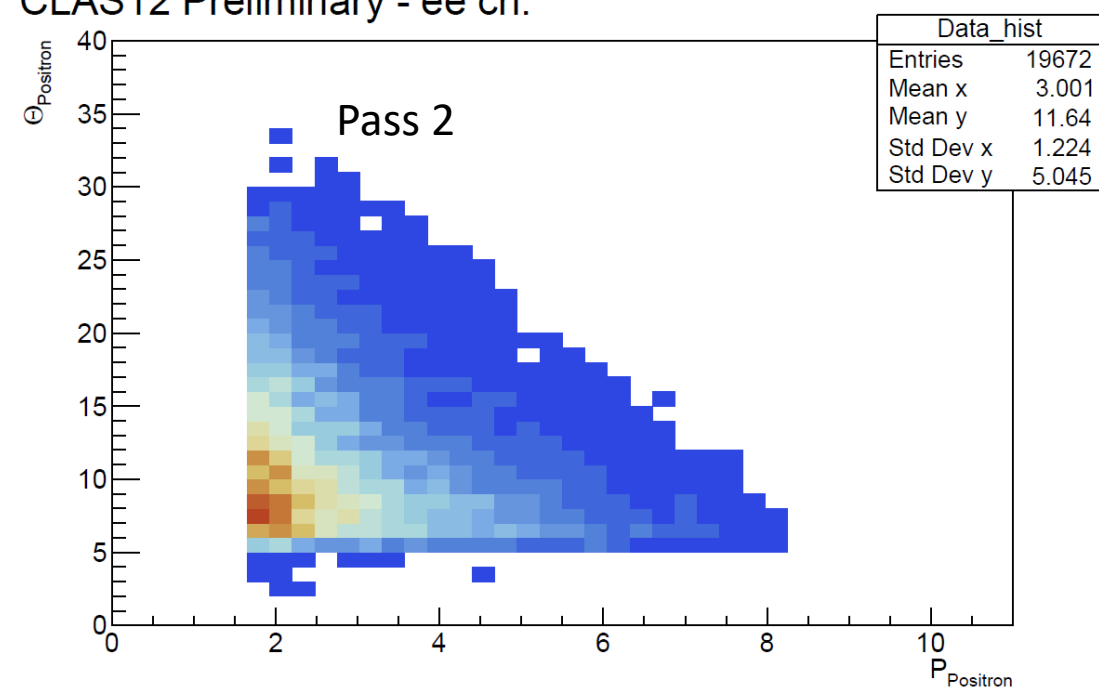
RG-A Spring 19 Pass 2 - Dilepton final state - Polar angle electron



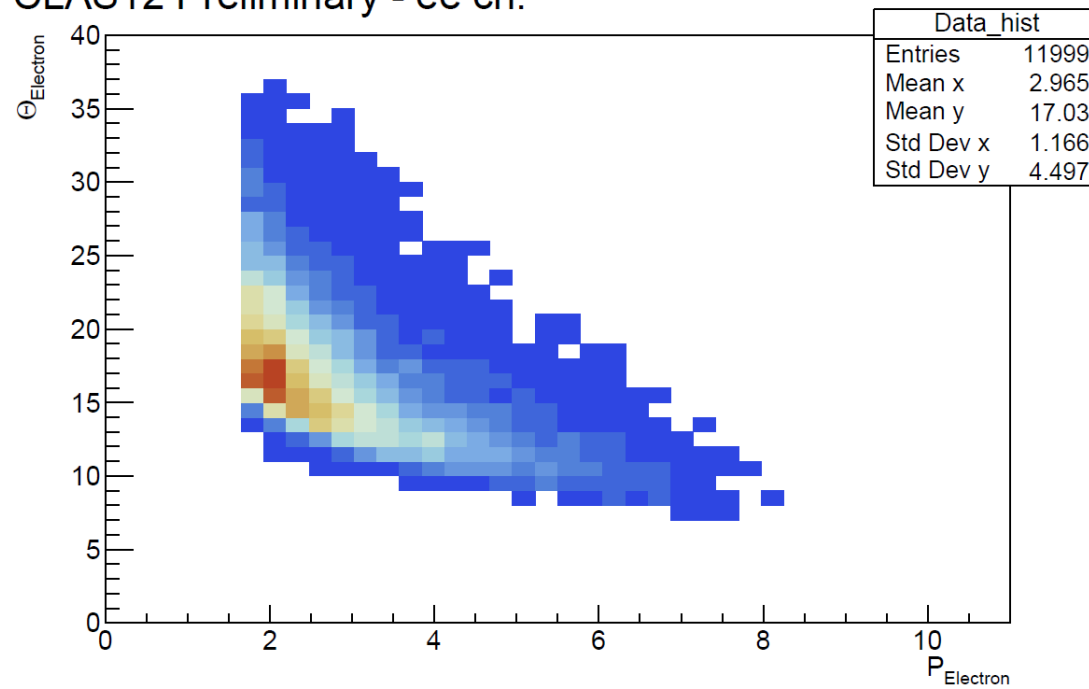
CLAS12 Preliminary - ee ch.



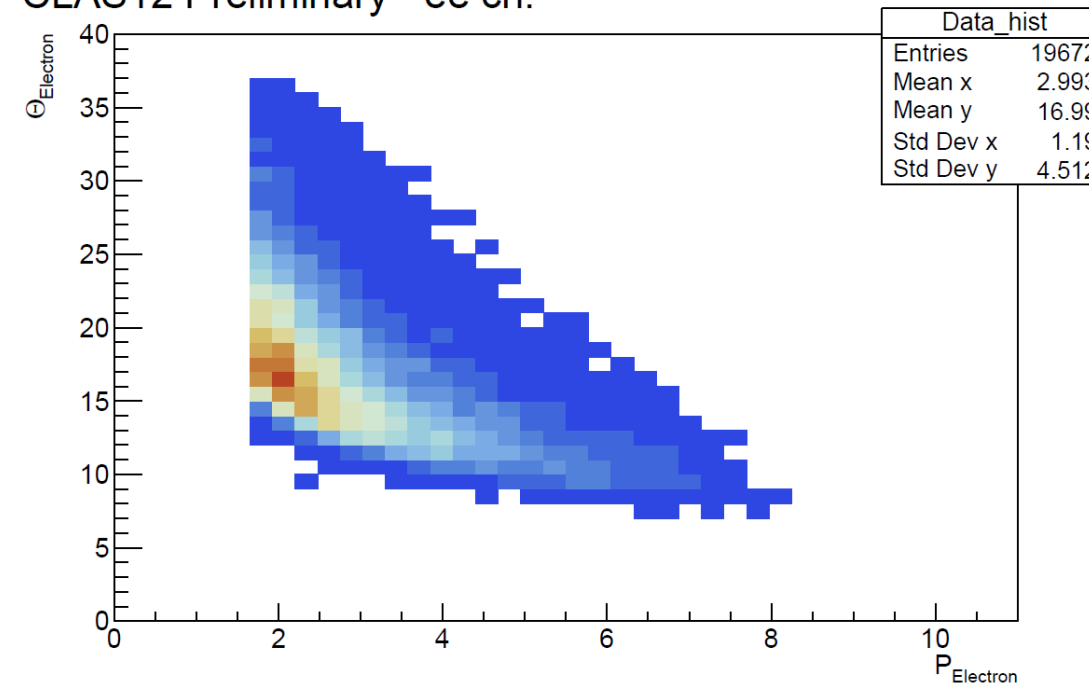
CLAS12 Preliminary - ee ch.



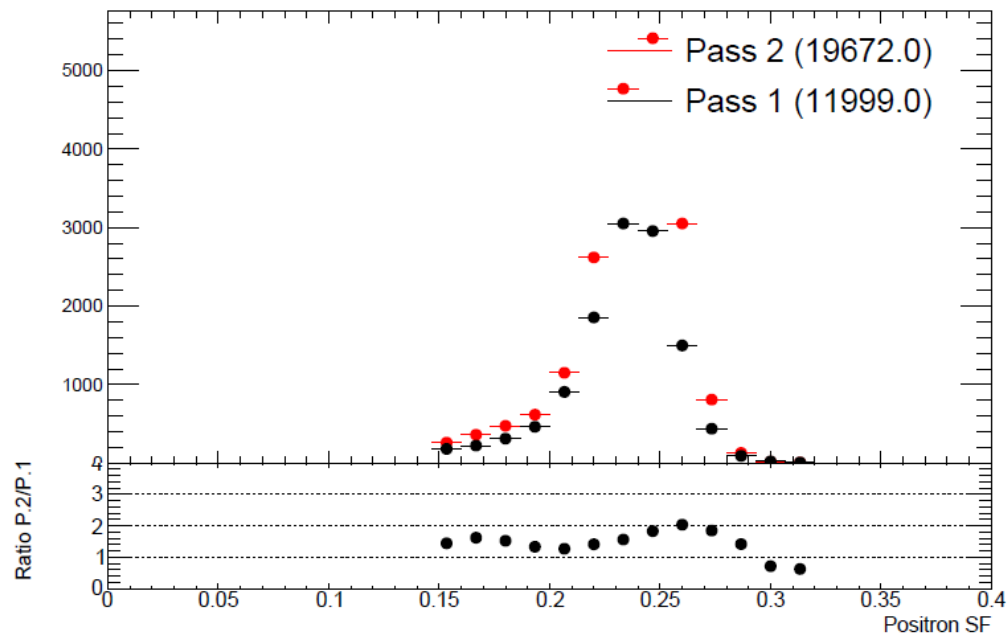
CLAS12 Preliminary - ee ch.



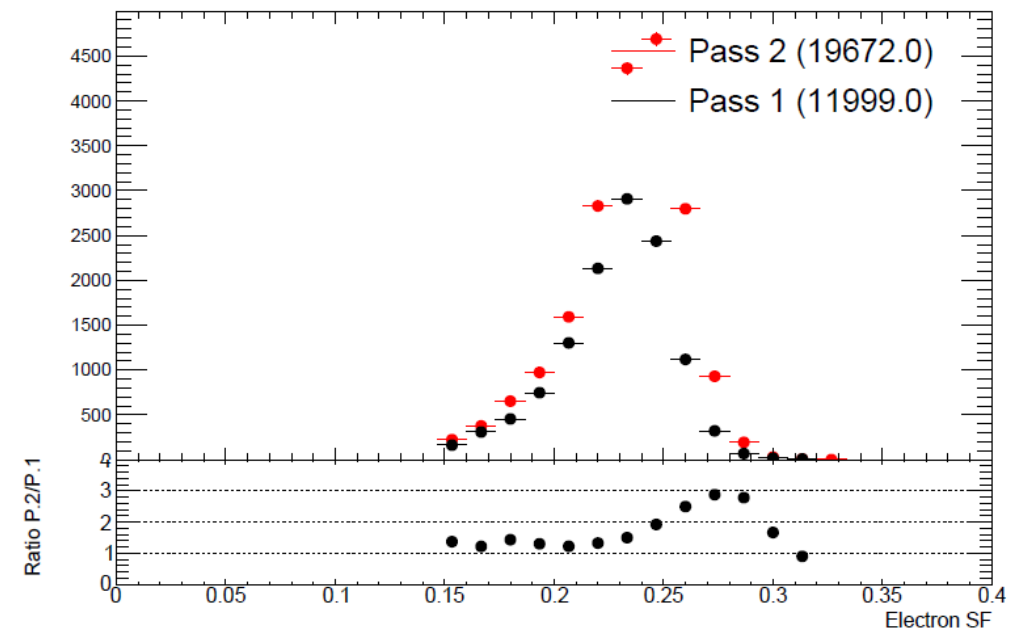
CLAS12 Preliminary - ee ch.



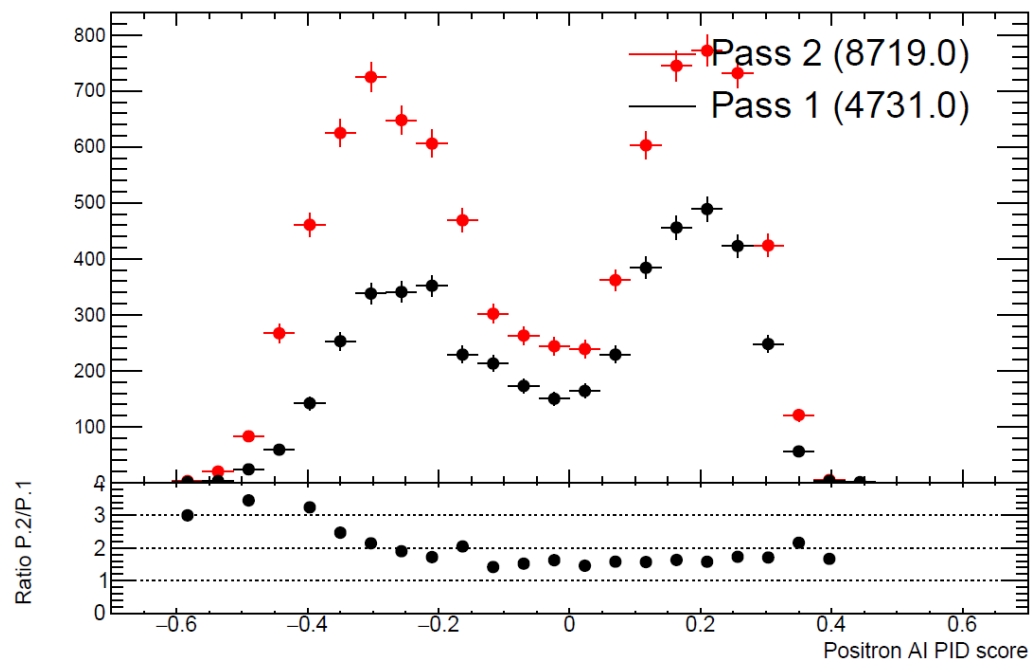
RG-A Spring 19 Pass 2 - Dilepton final state - Positron sampling fraction



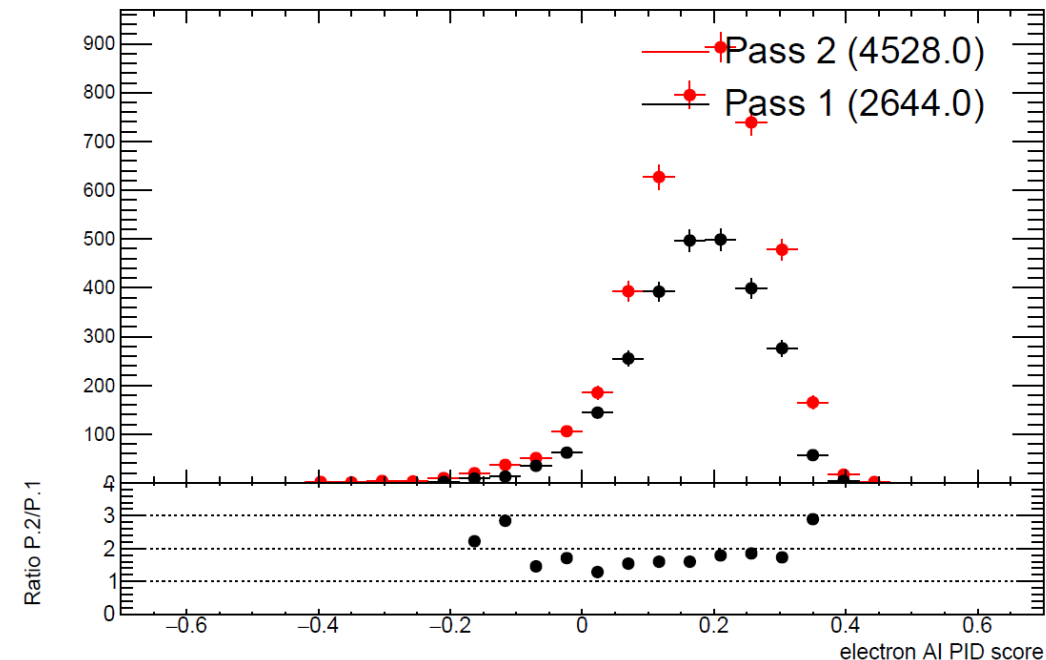
RG-A Spring 19 Pass 2 - Dilepton final state - Electron sampling fraction

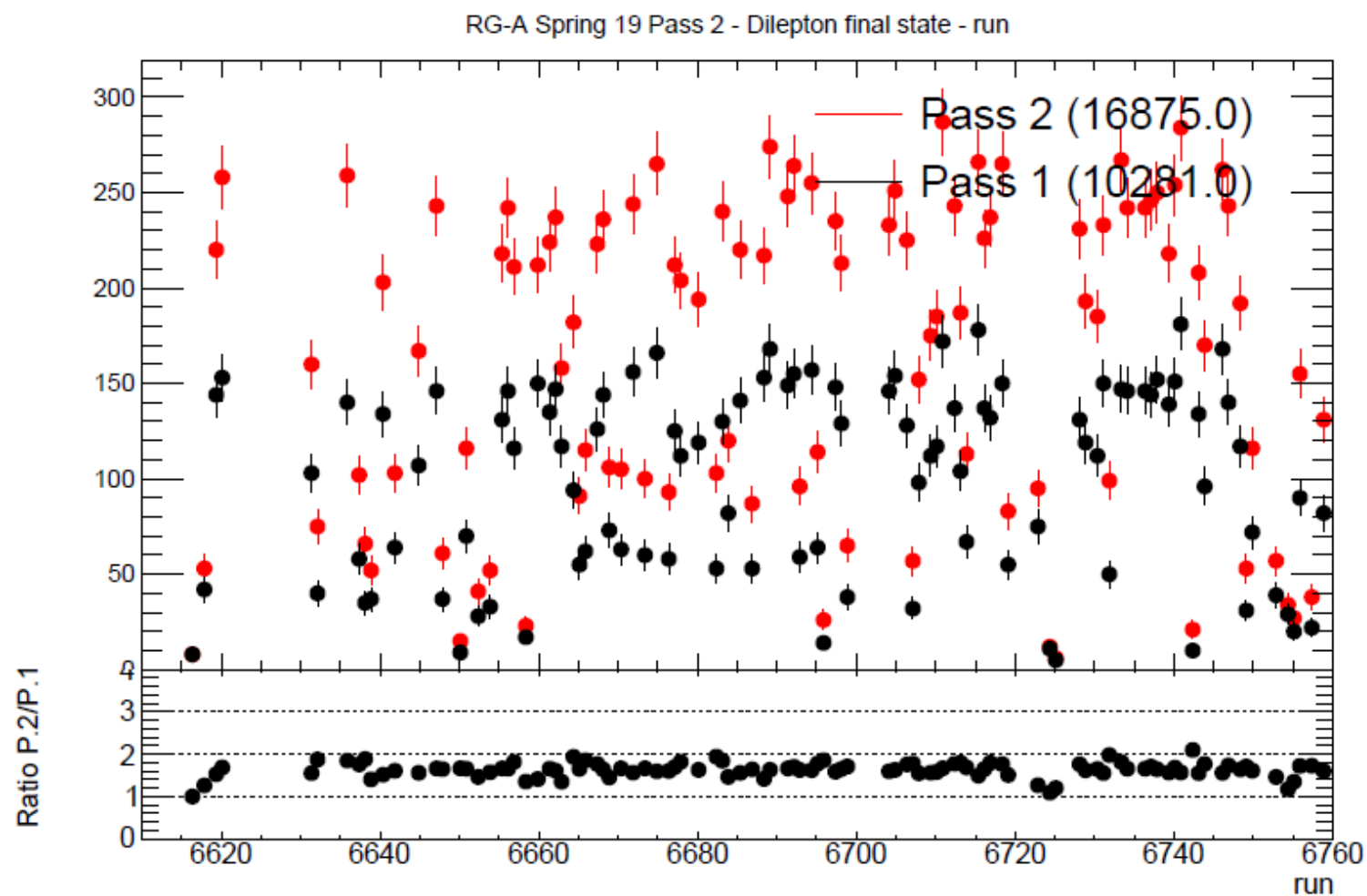


RG-A Spring 19 Pass 2 - Dilepton final state - AI PID positron score, for momenta larger than 4 GeV



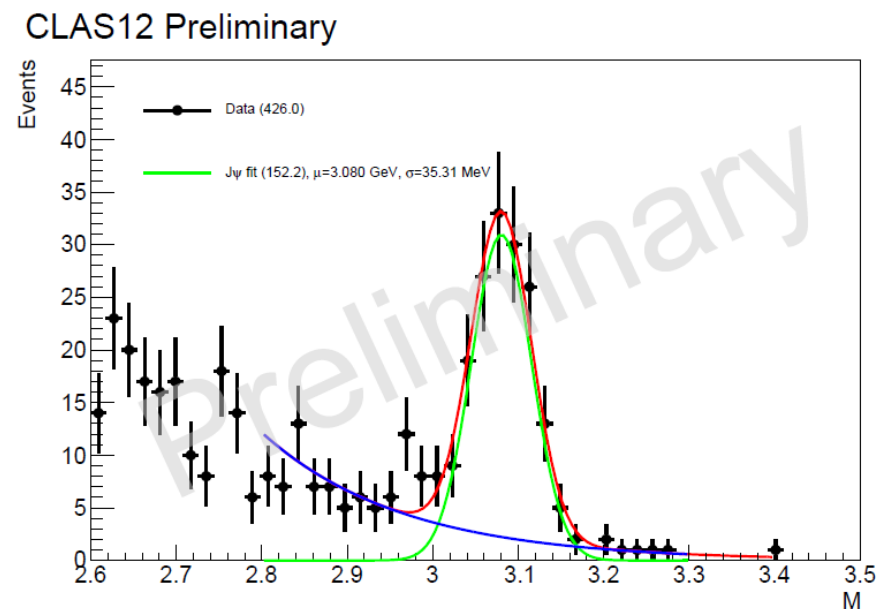
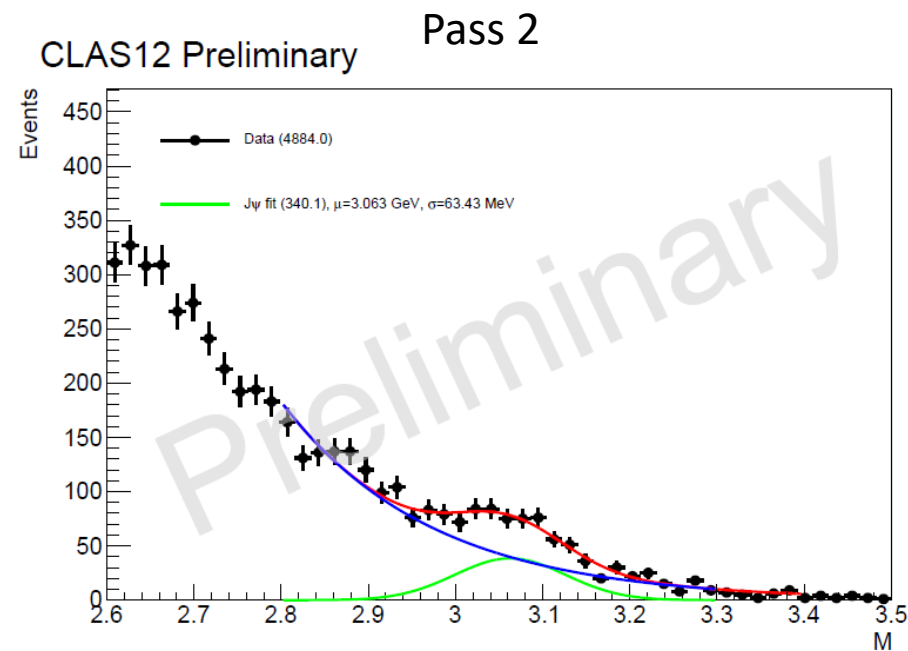
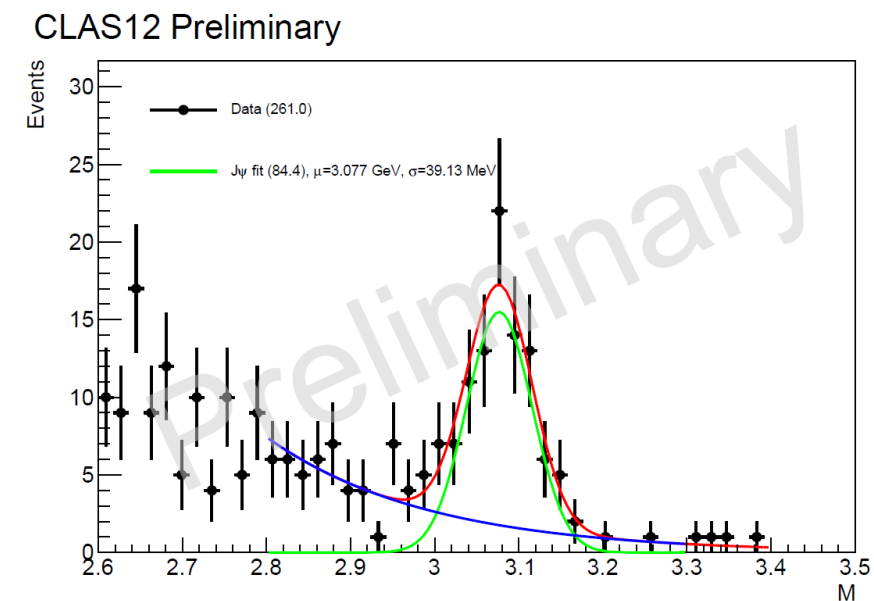
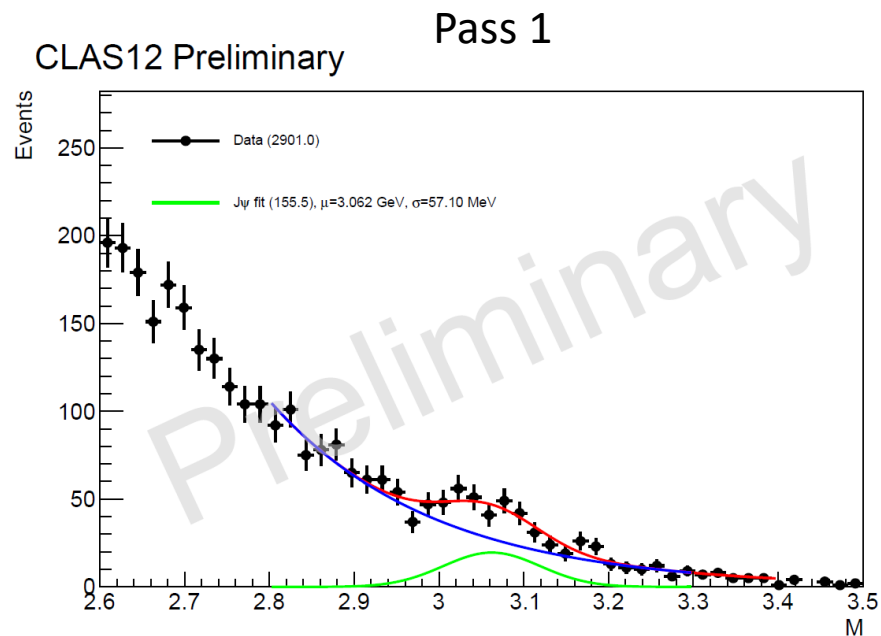
RG-A Spring 19 Pass 2 - Dilepton final state - AI PID electron score, for momenta larger than 4 GeV



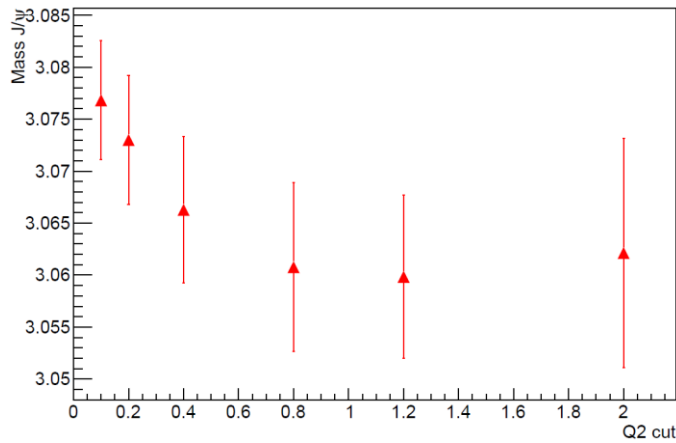
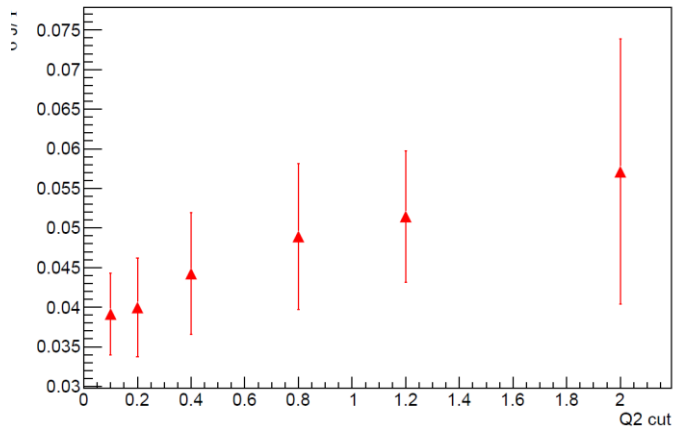
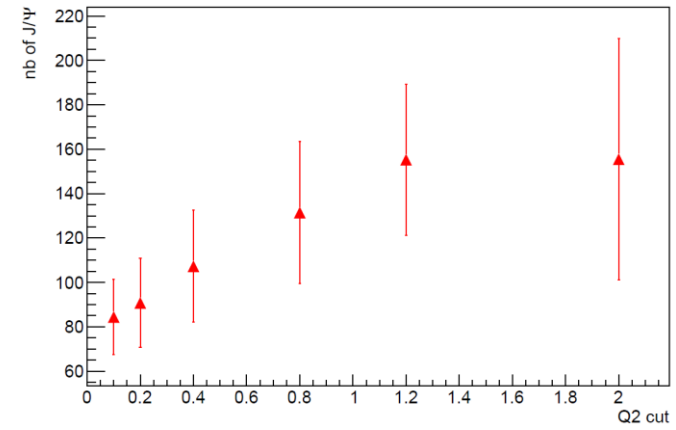


Run 6751 not in pass 2...
Only 95 events out of 2M

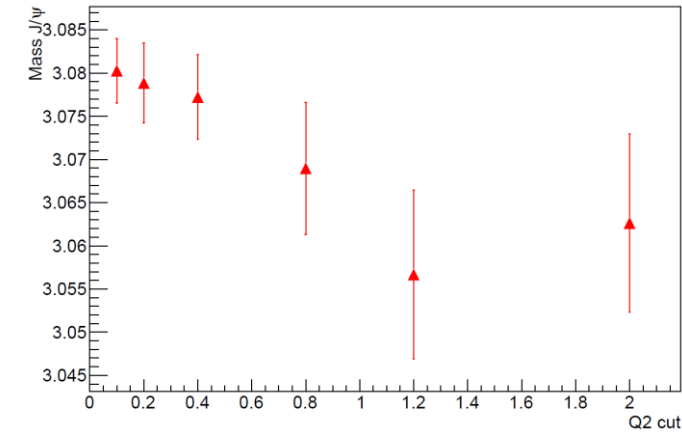
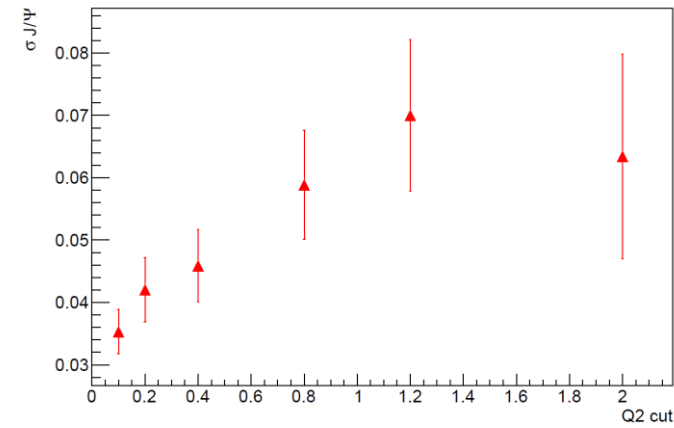
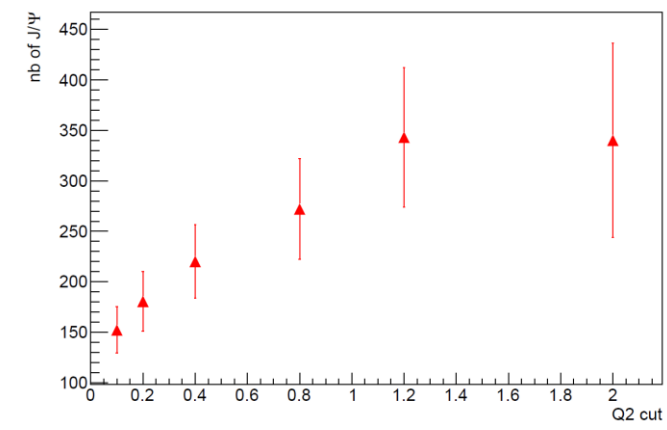
Invariant mass fits



Pass 1



Pass 2



Fall 2018

