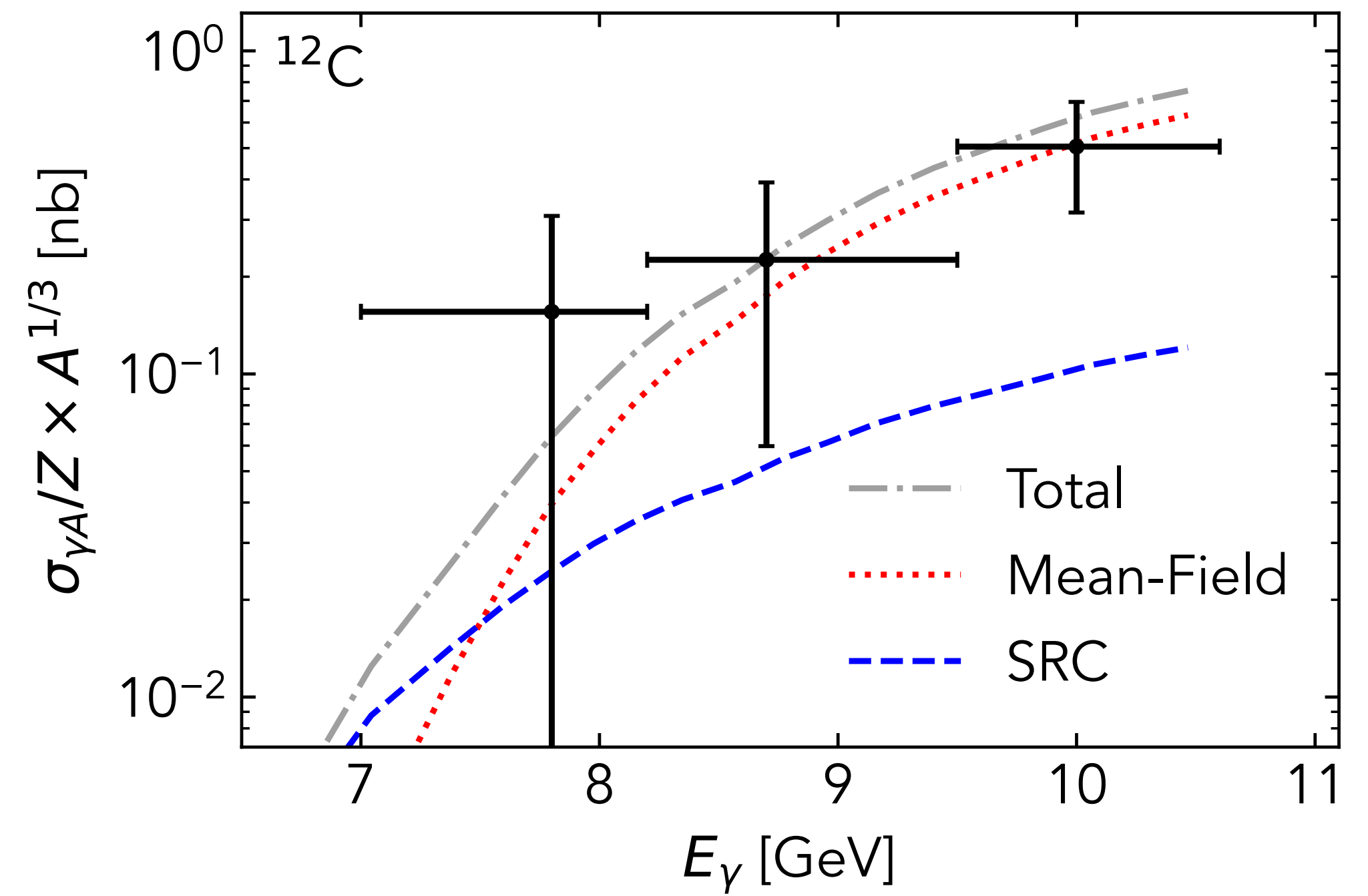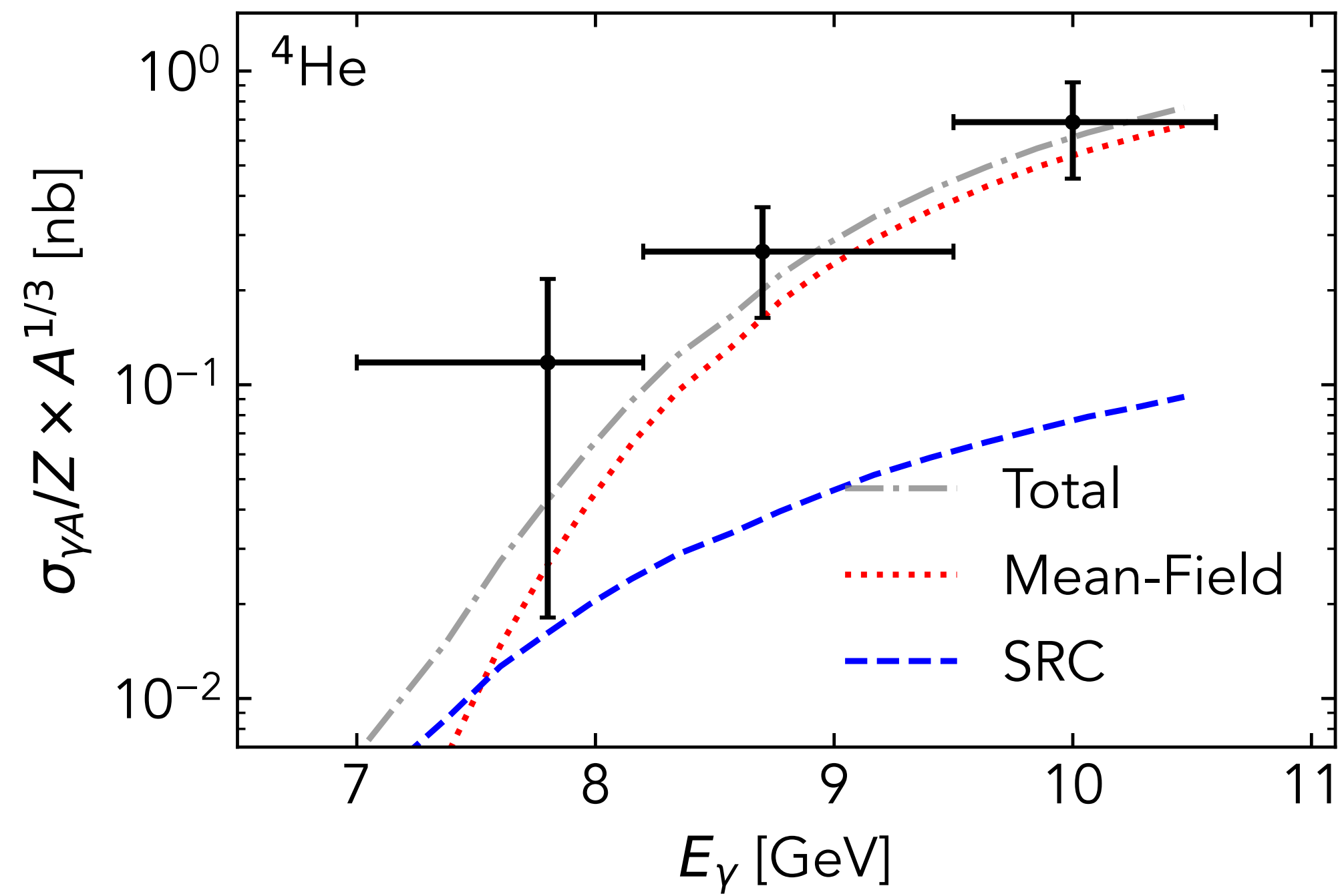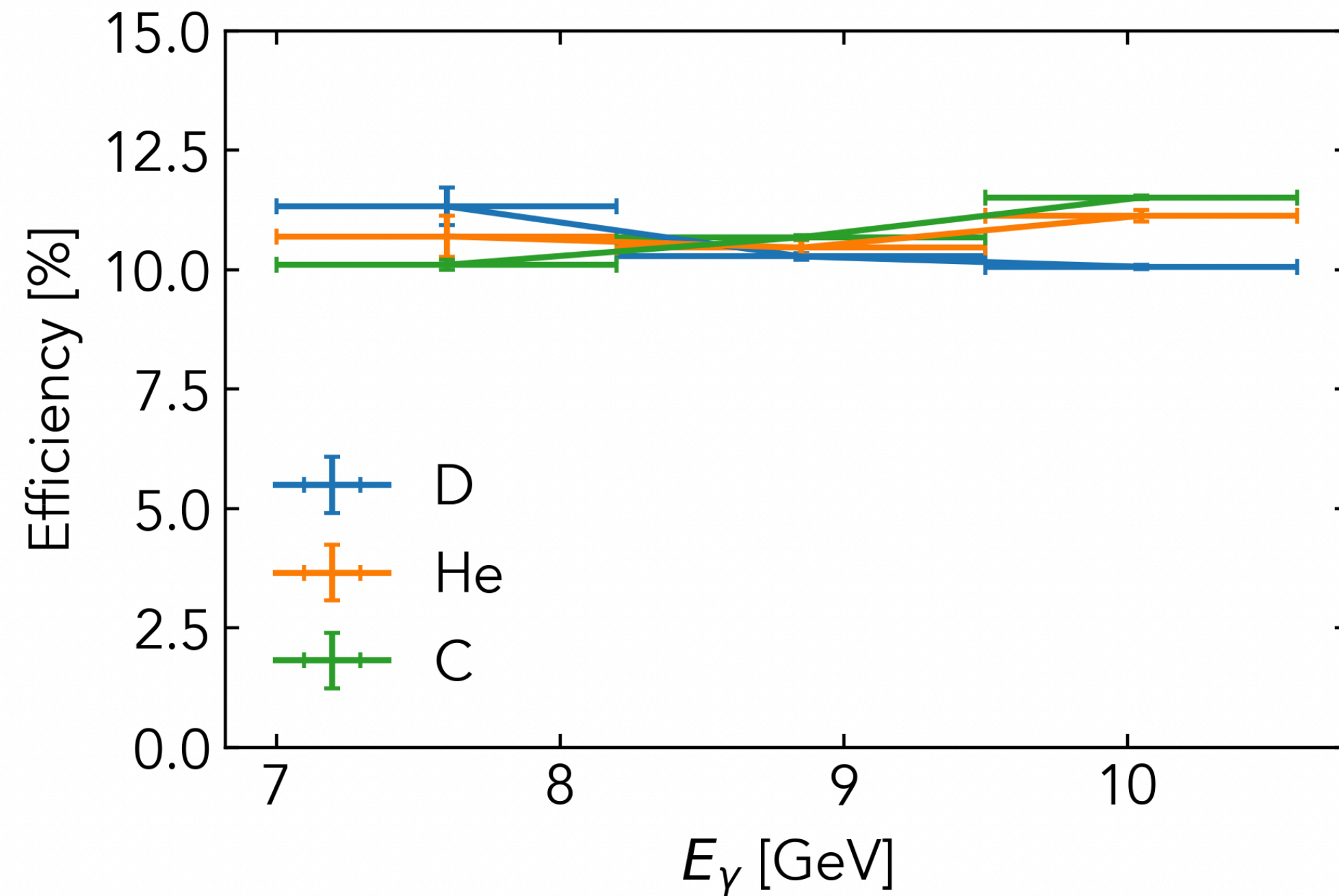# Update for last week on individual cross sections:
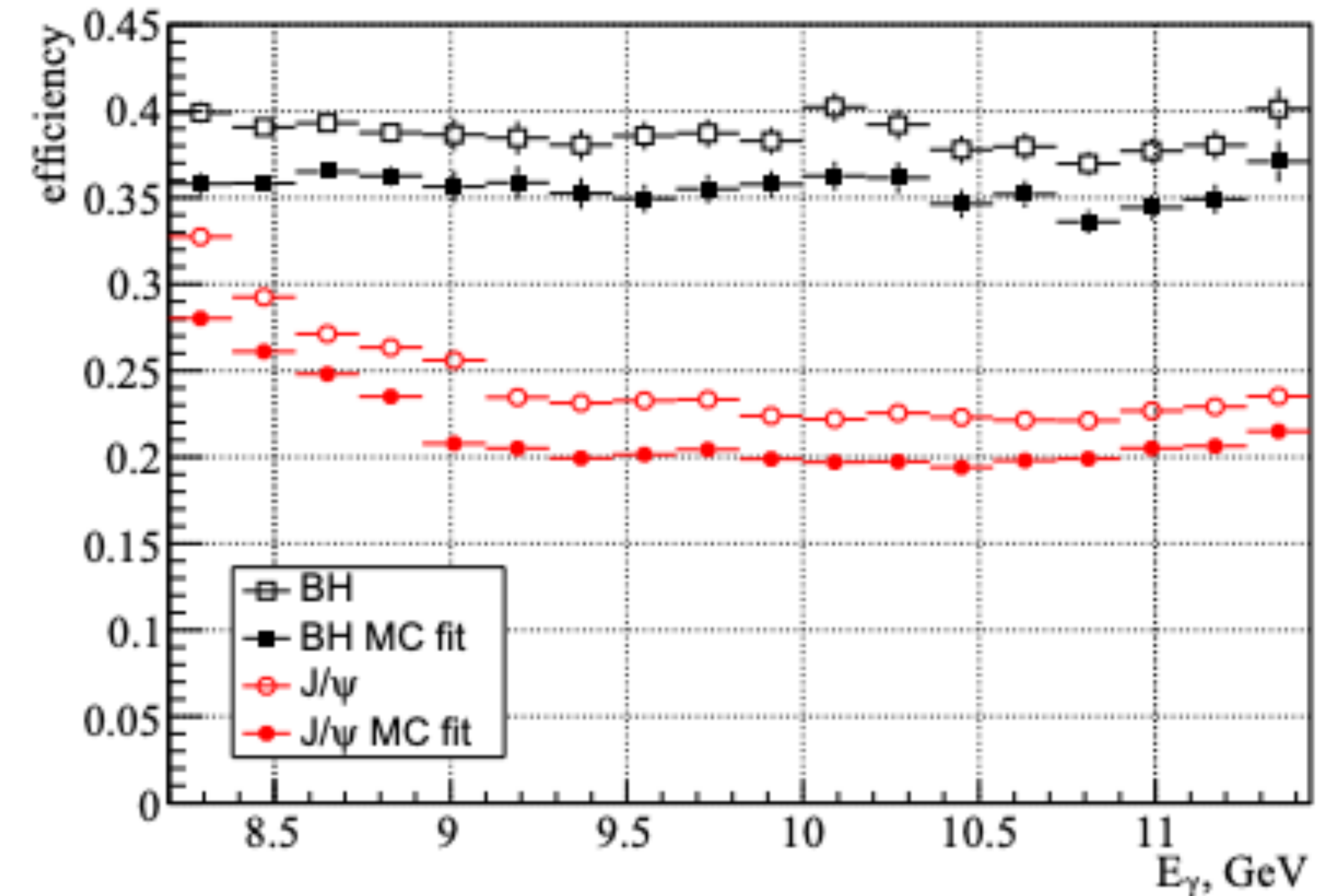
We would like to increase the efficiency for J/ψ

SRC-CT

GlueX

Should be able to get a factor of 2 events back
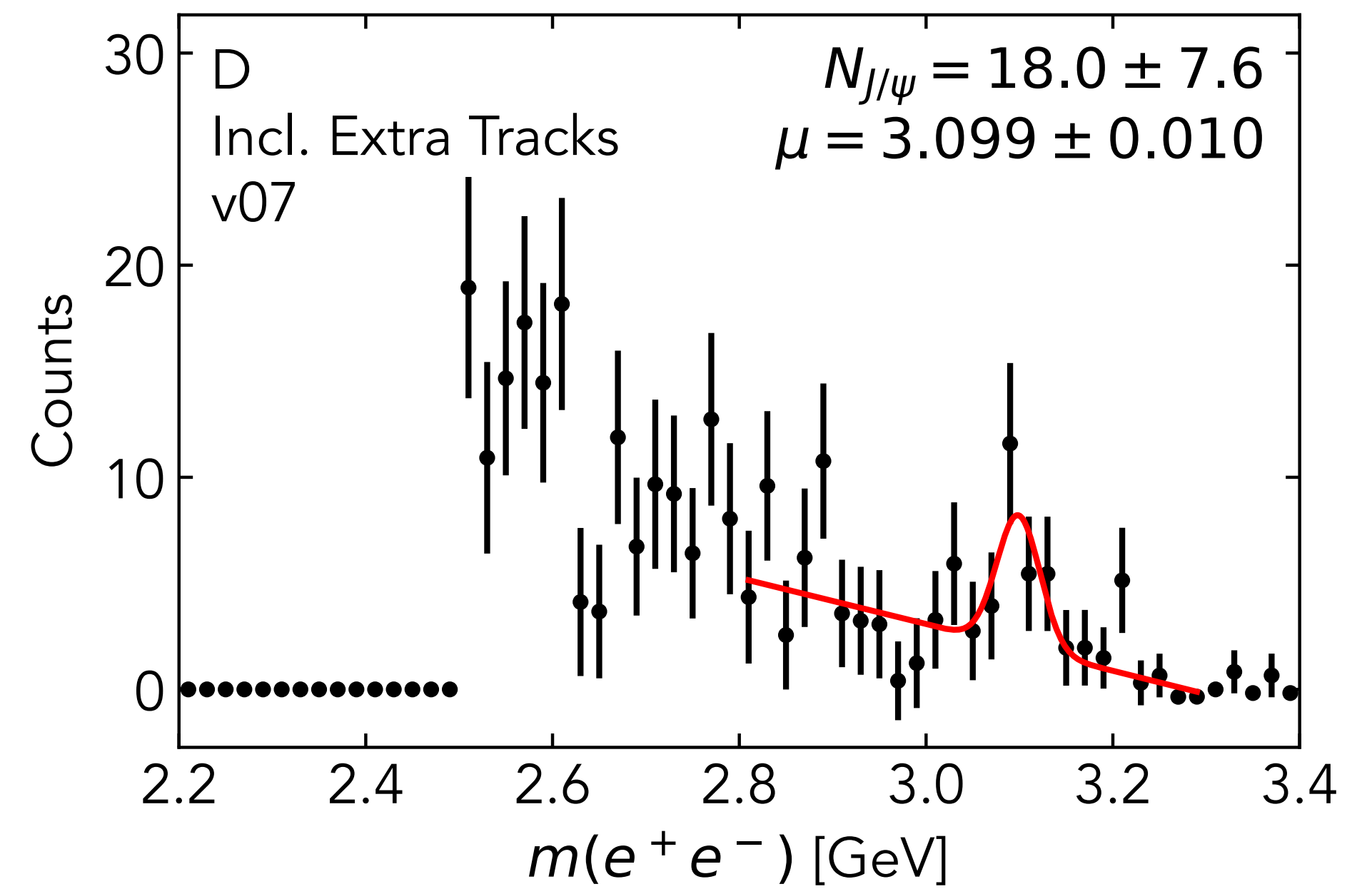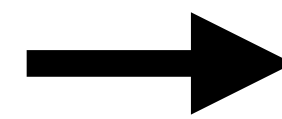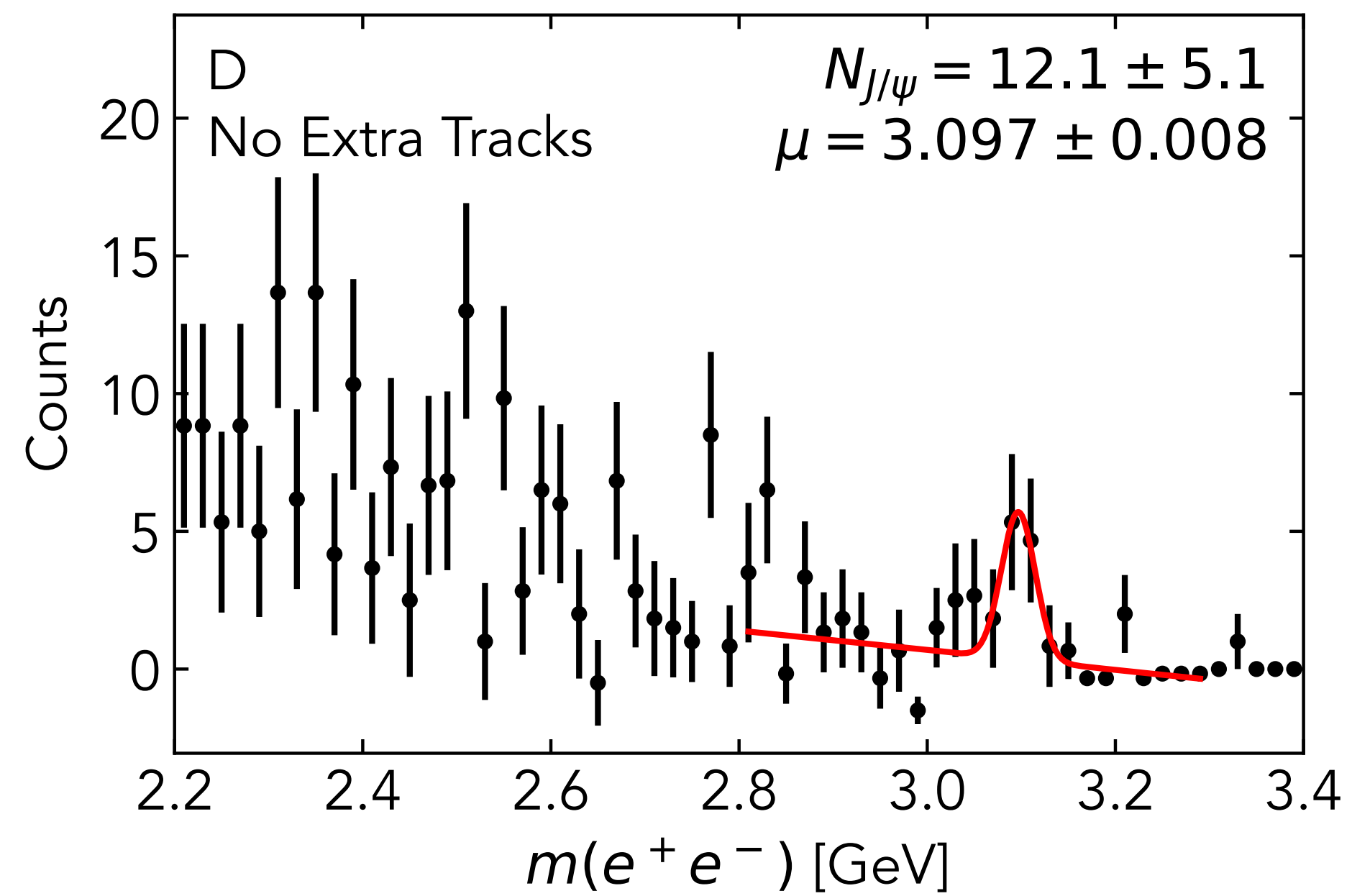
Current cuts

- KinFit CL $> 10^{-3}$

- Proton PID FOM > 0.05

- No extra tracks/showers

- $7 < E_\gamma < 10.8$ GeV

- $p_{track} > 0.4$ GeV

- $\theta_{track} > 2°$

- Lepton p/E

- Lepton BCAL preshower

- Energy balance

- Vertex

- $M_{ee} > 2$ GeV

Current cuts

- ~~KinFit CL > 10^{-3}~~

- ~~Proton PID FOM > 0.05~~

- **1** extra tracks/showers

- $7 < E_\gamma < 10.8$ GeV

- $p_{track} > 0.4$ GeV

- $\theta_{track} > 2°$

- Lepton p/E

- Lepton BCAL preshower
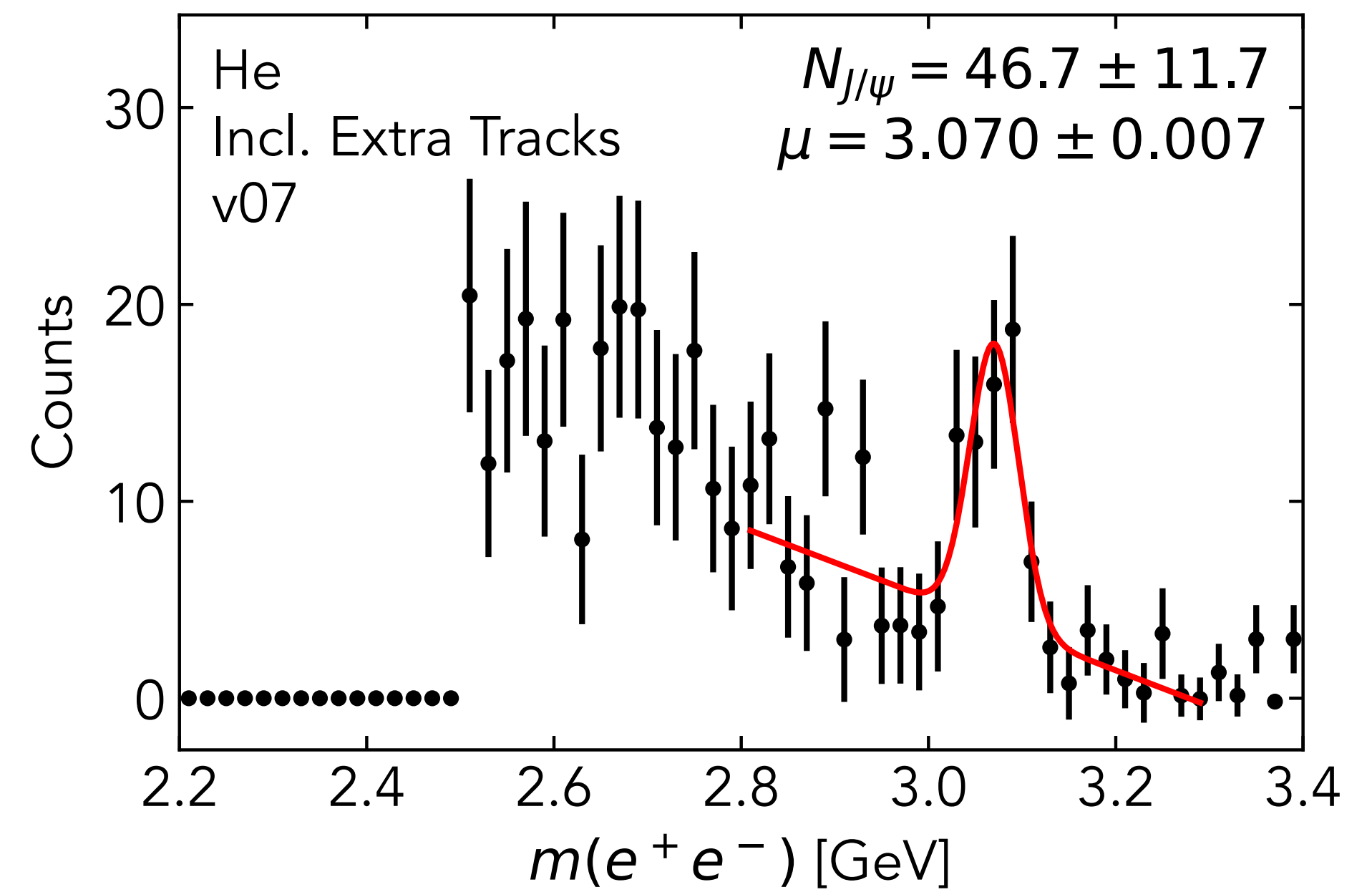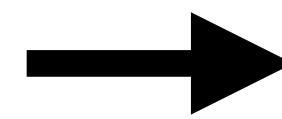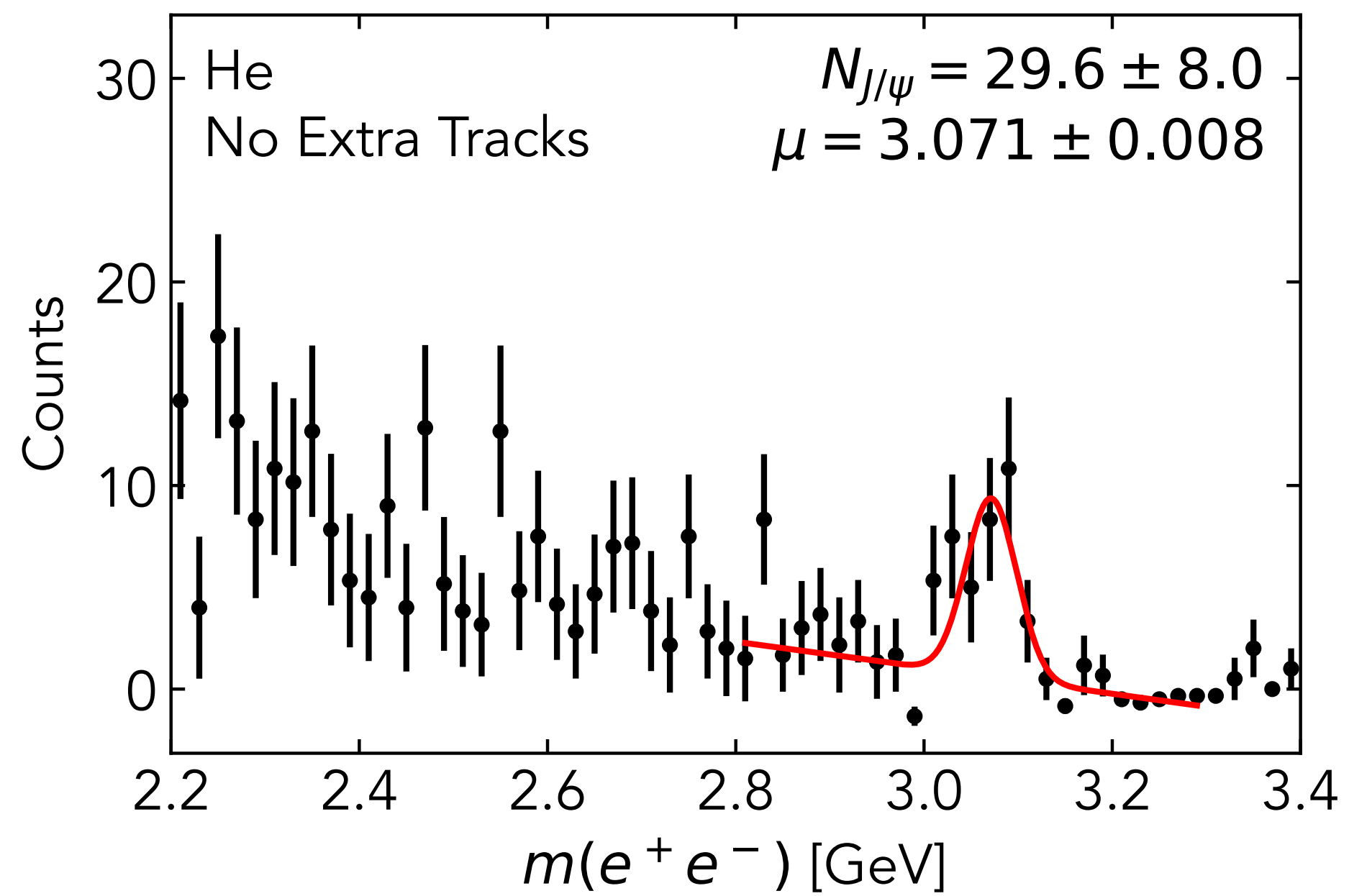
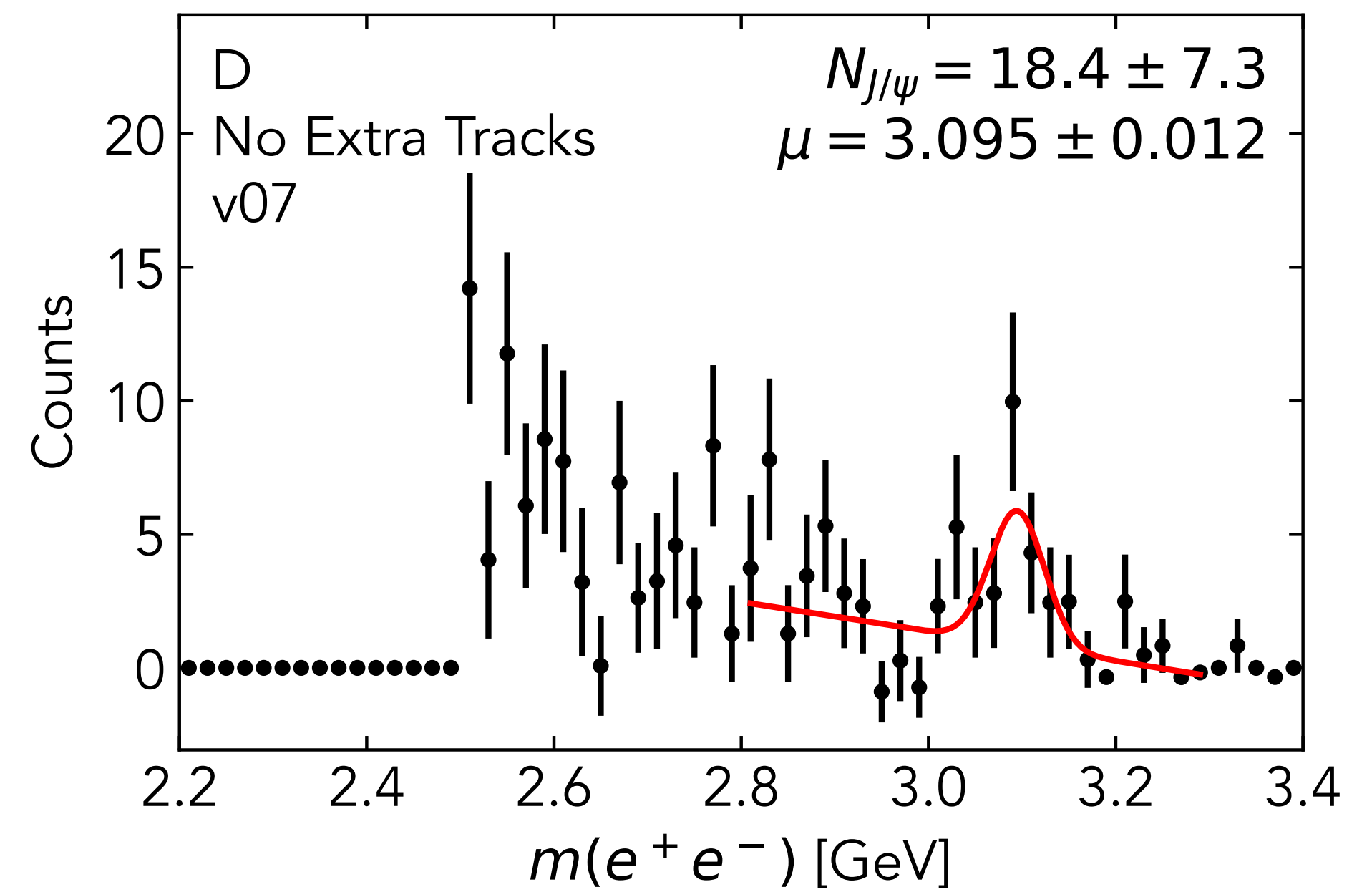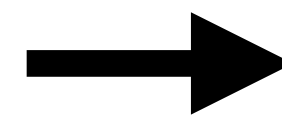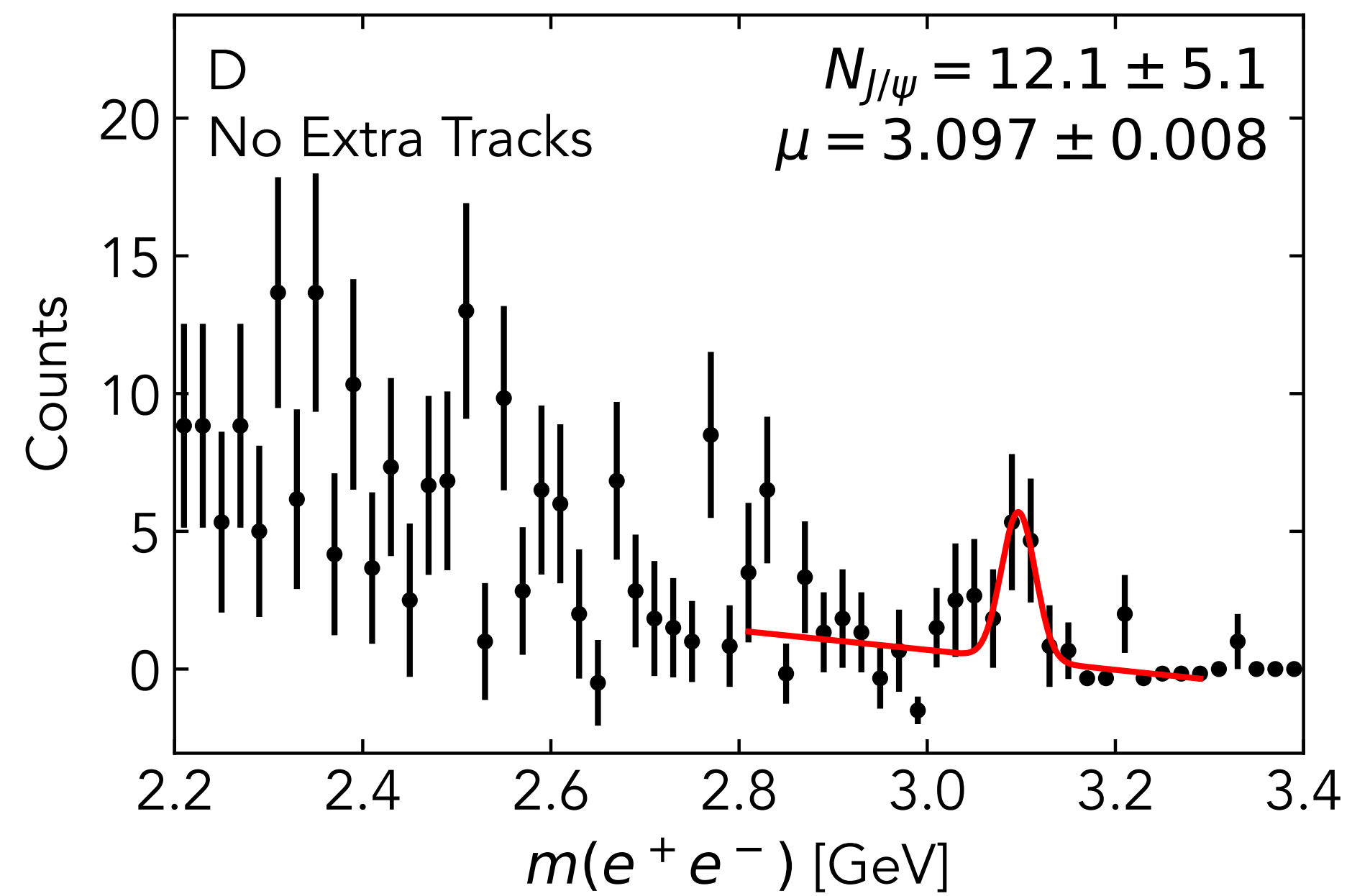- Energy balance

- Vertex

- $M_{ee} > 2$ GeV

Impact on J/ψ yields

Impact on J/ψ yields

He
No Extra Tracks
$N_{J/\psi} = 29.6 \pm 8.0$
$\mu = 3.071 \pm 0.008$

He
Incl. Extra Tracks
v07
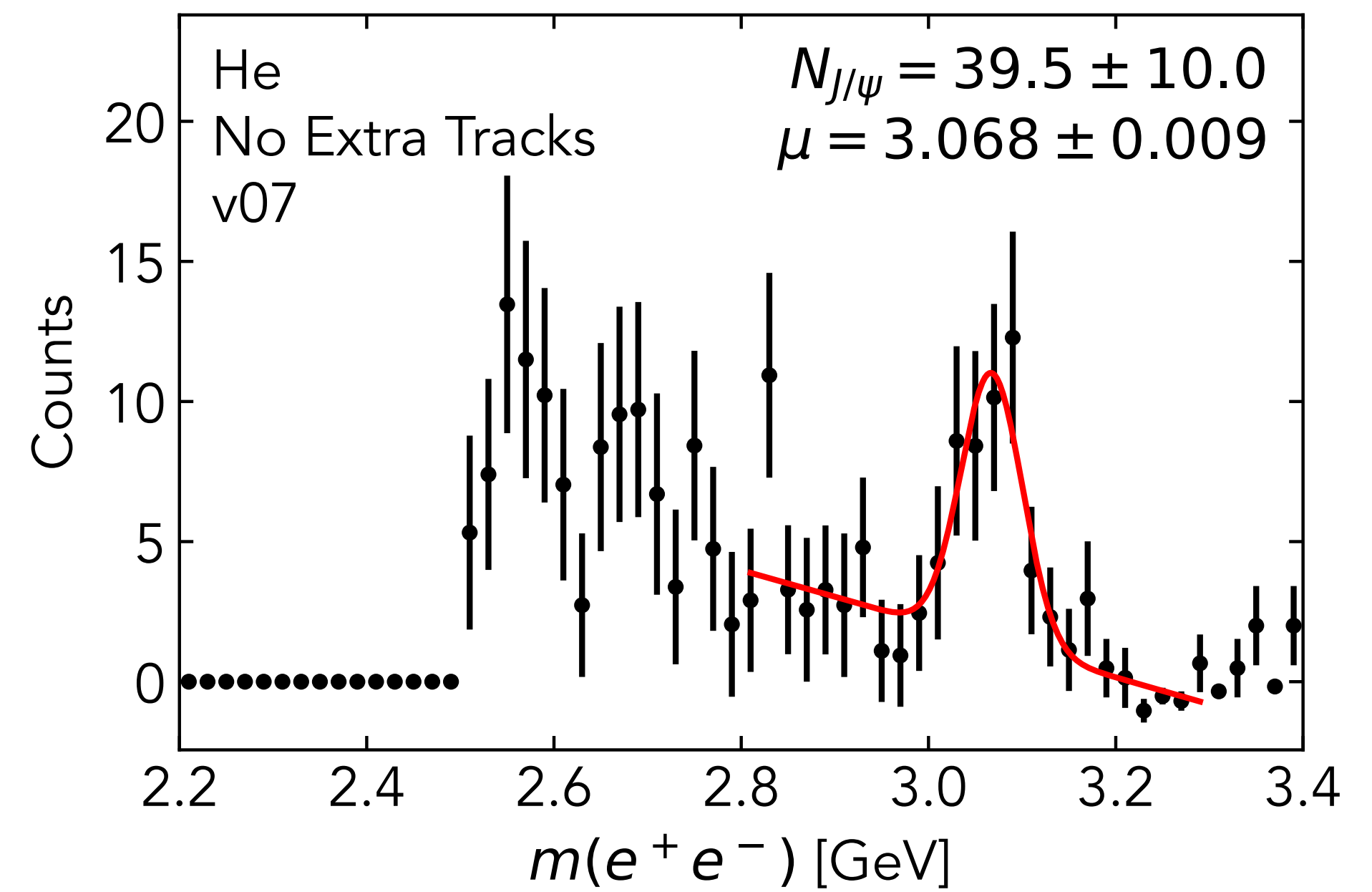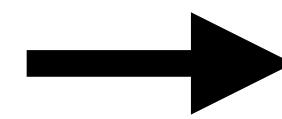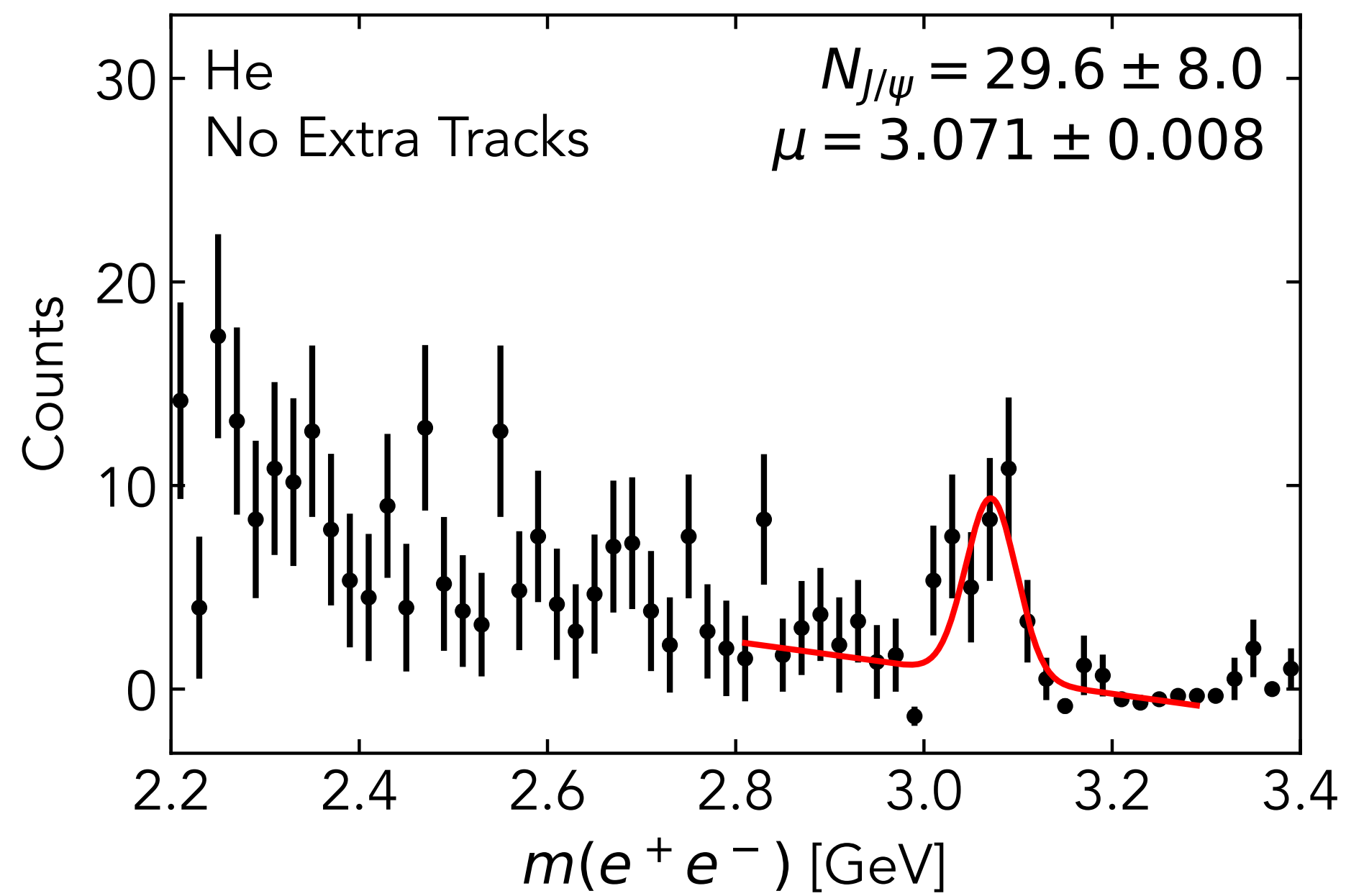$N_{J/\psi} = 46.7 \pm 11.7$
$\mu = 3.070 \pm 0.007$

Counts

$m(e^+e^-)$ [GeV]

Trying to restrict again on additional tracks/showers

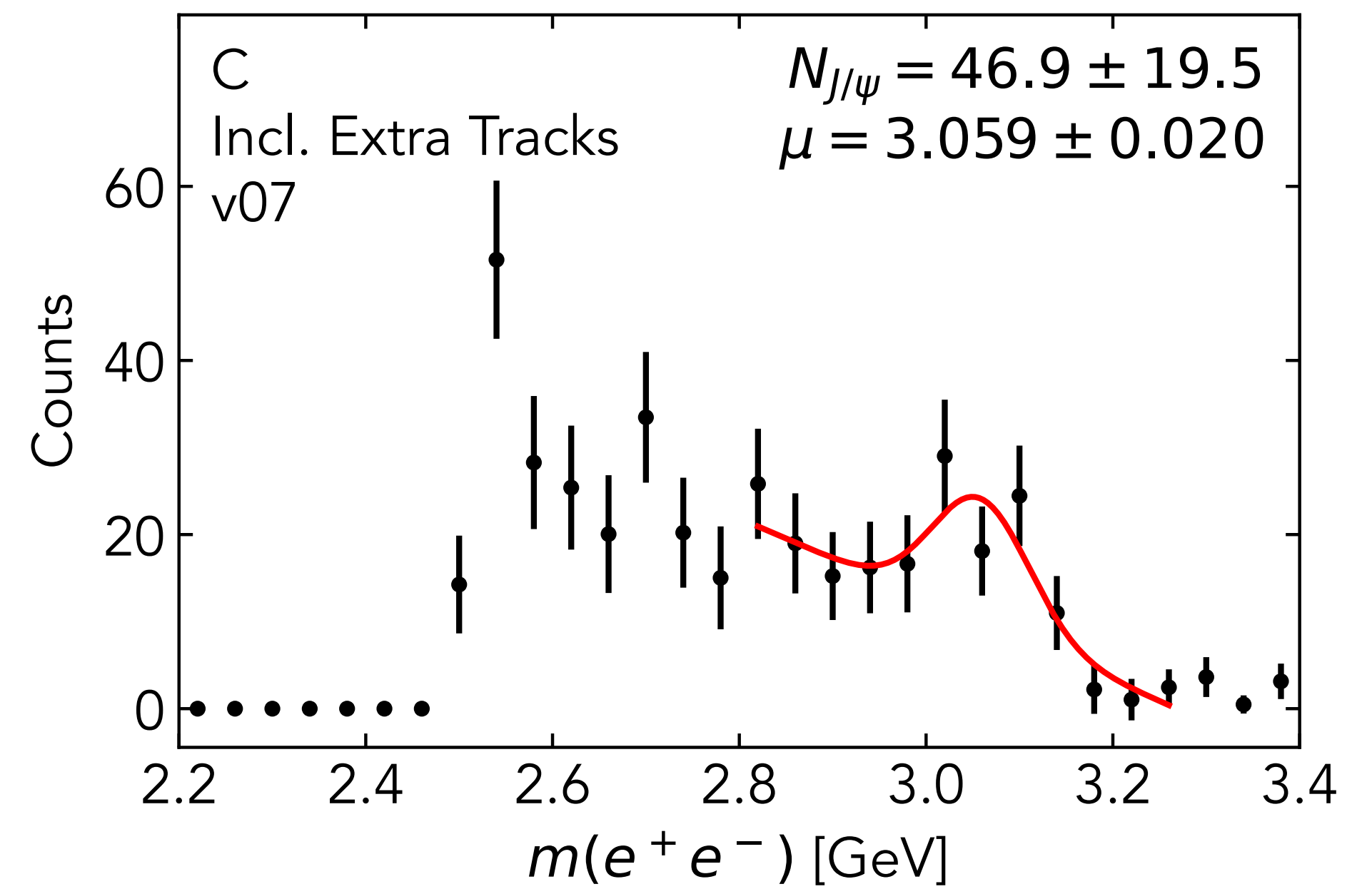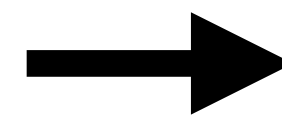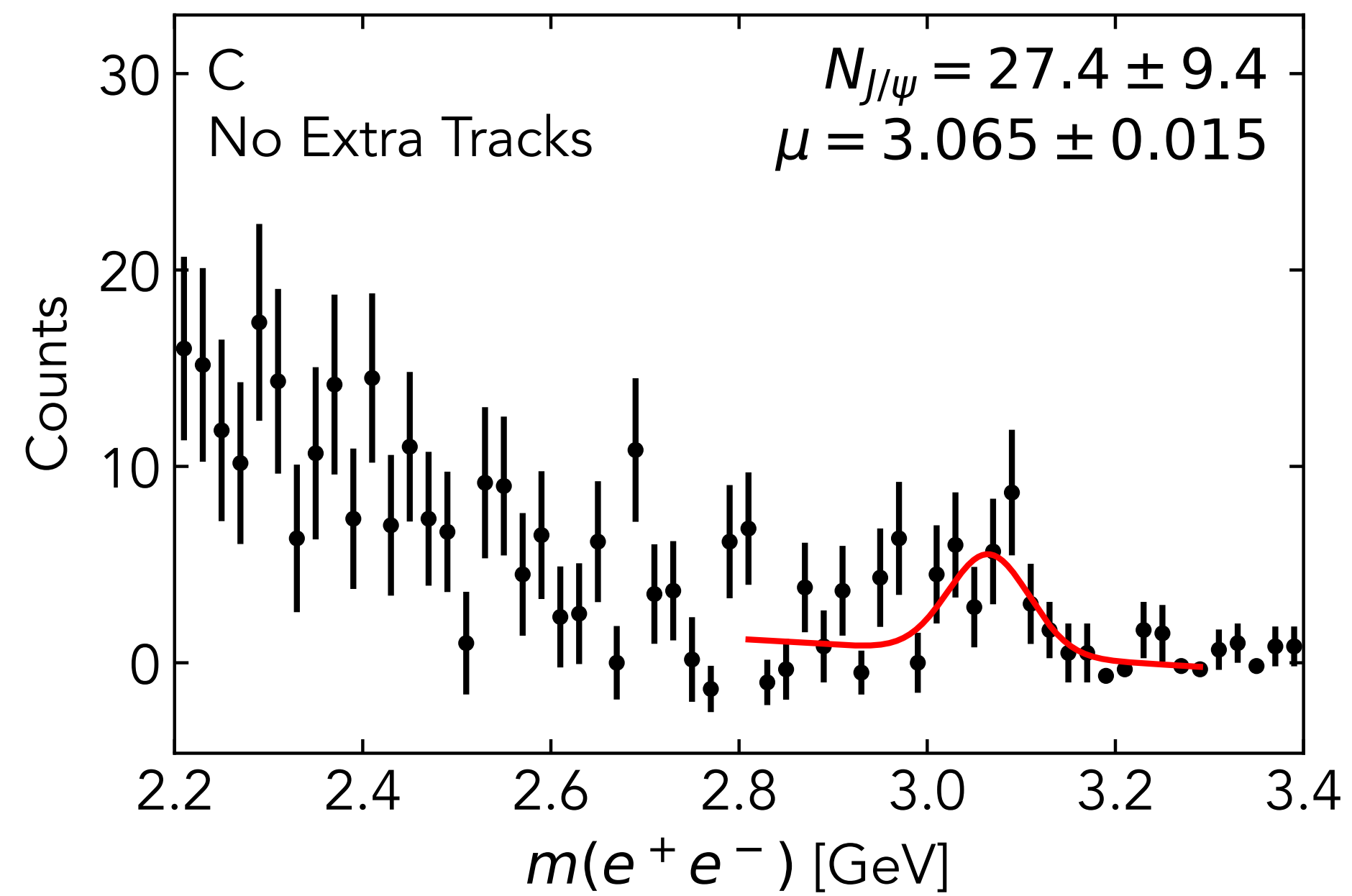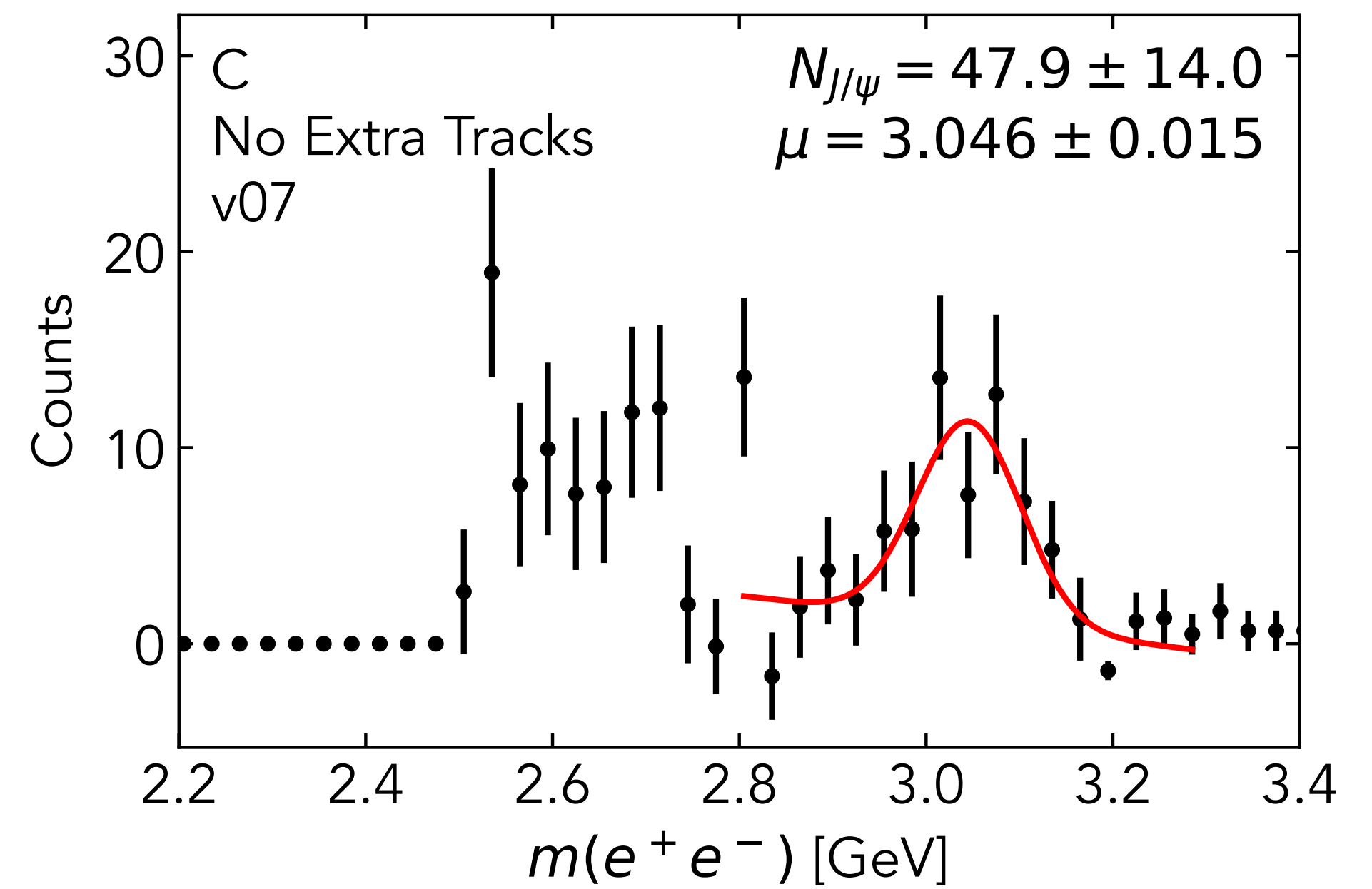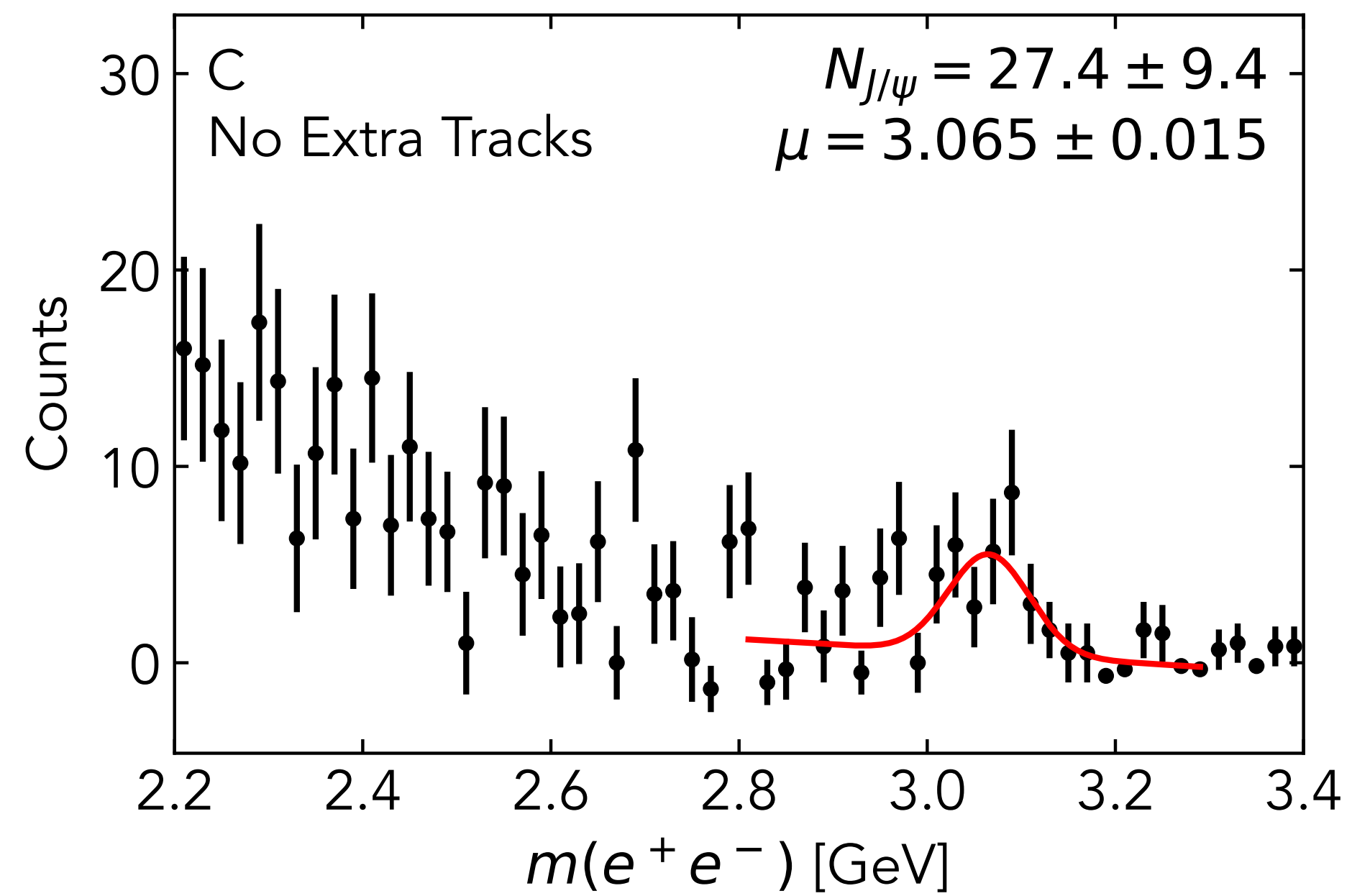# Impact on J/ψ yields

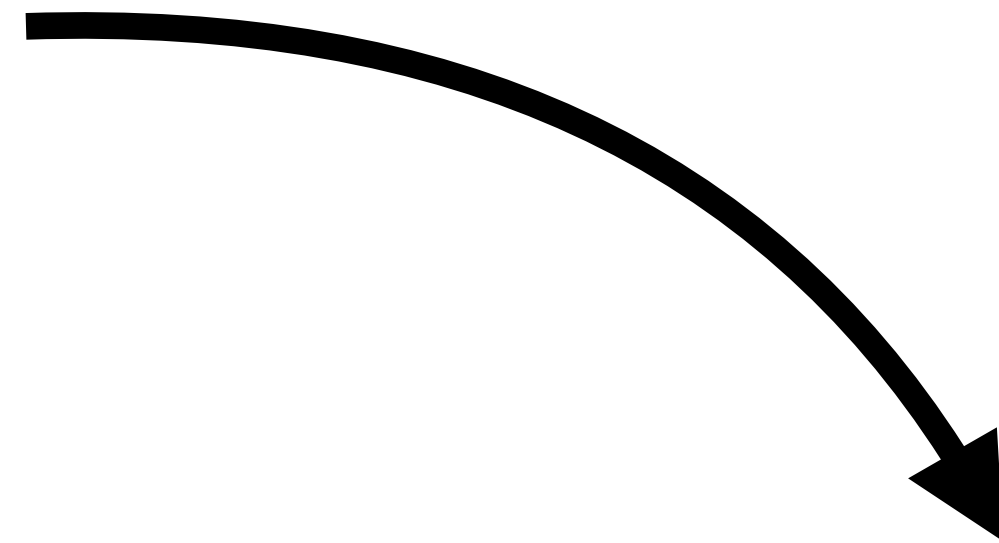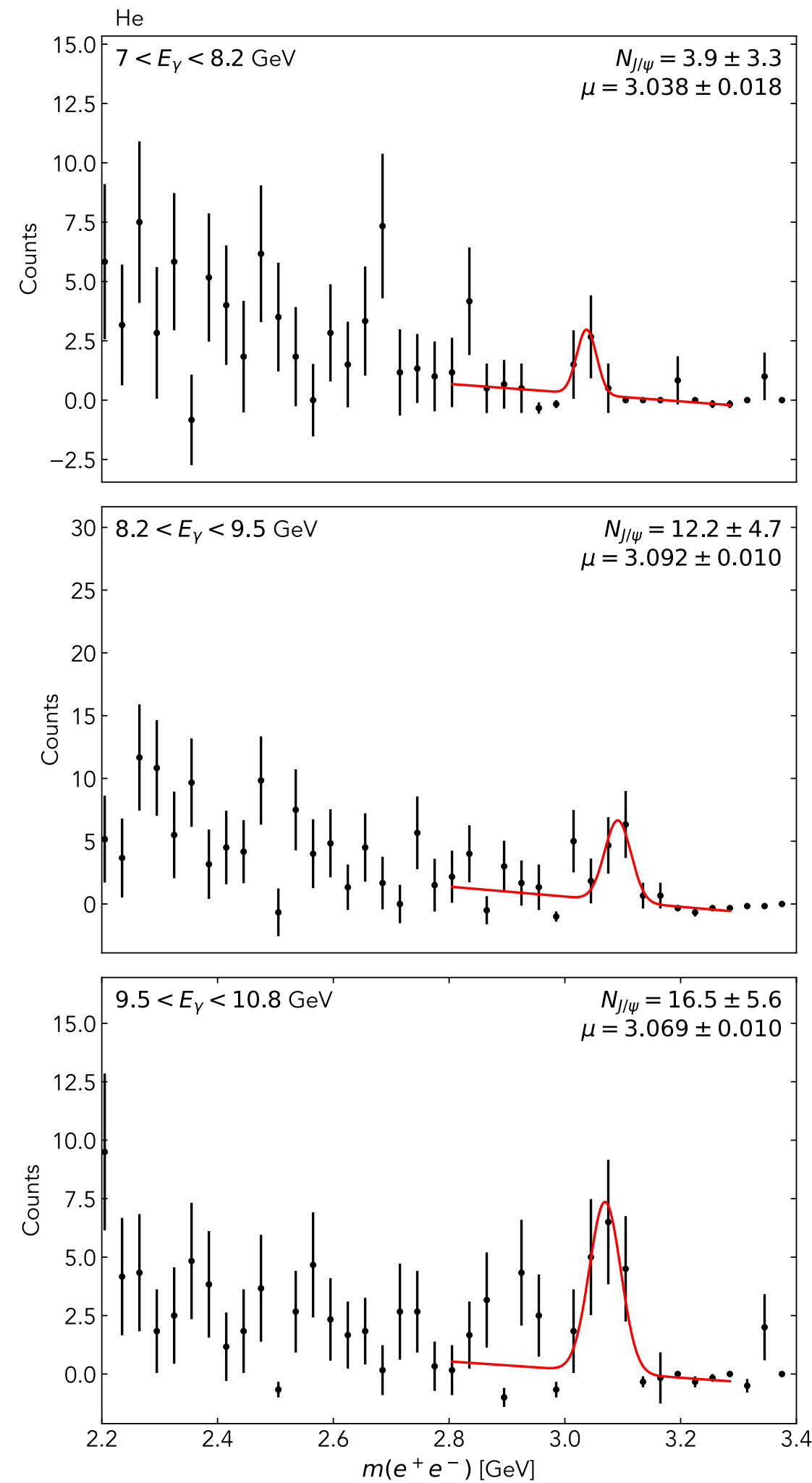# Impact on J/ψ yields

Impact on J/ψ yields

Impact on J/ψ yields
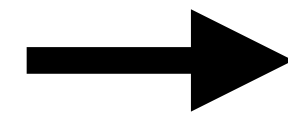
Conclusion

- 50% improvement in yield, but similar increase in uncertainties resulting from background

- Need to optimize the loosening/tightening of cuts

- Trying to loosen cuts in ReactionFilter as well

Addendum on cross section calculation

$$\frac{Y_{J/\psi}(E_\gamma)}{\mathscr{L}(E_\gamma)\epsilon(E_\gamma)\mathscr{B}(J/\psi \to e^+e^-)} = \sigma(E_\gamma)$$