

# Analysis Progress on DVMP

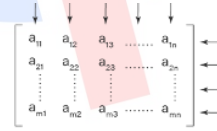
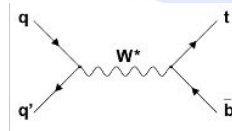
$$ep \rightarrow e'p' J/\psi(ee) \quad +$$

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Supervisor: Prof. Nathaly

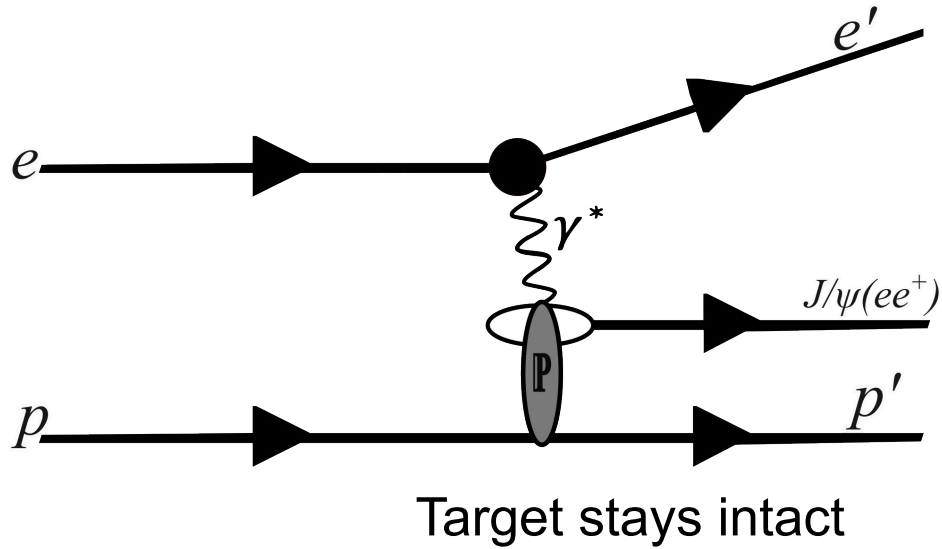


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New Hampshire

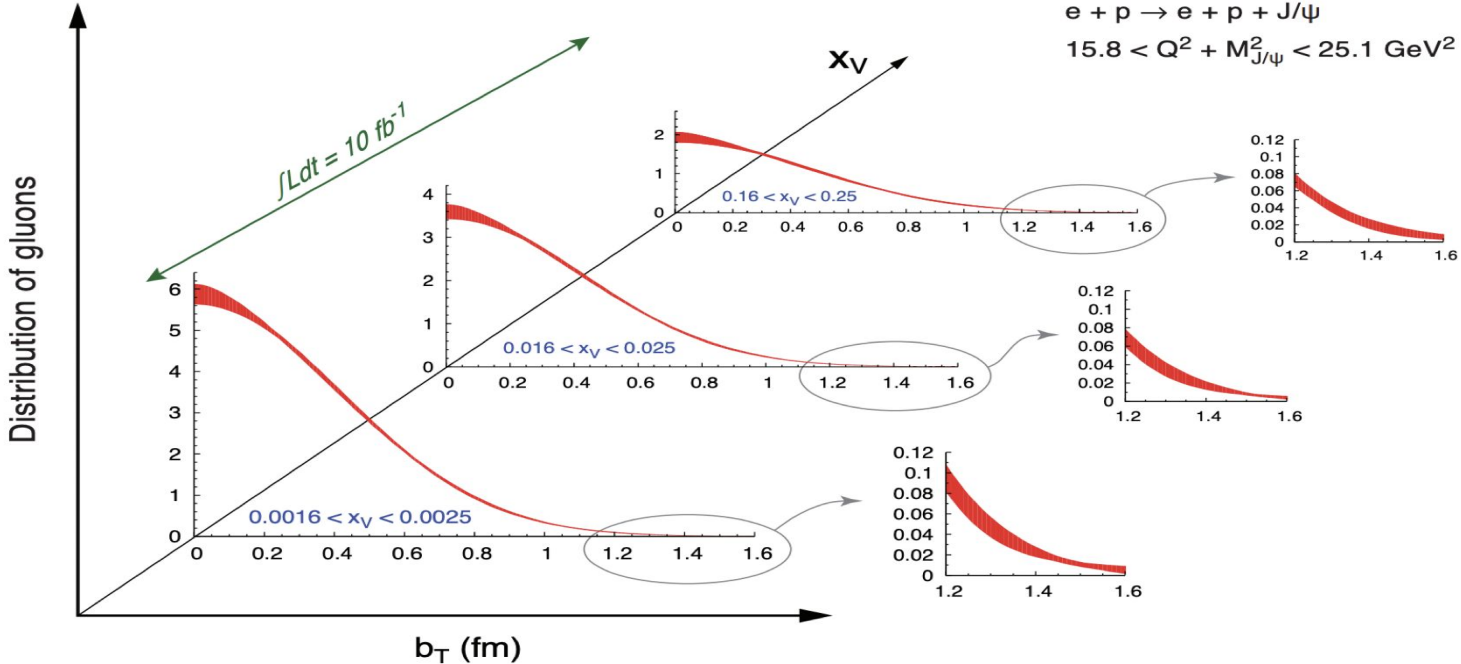


# Reaction of Study:

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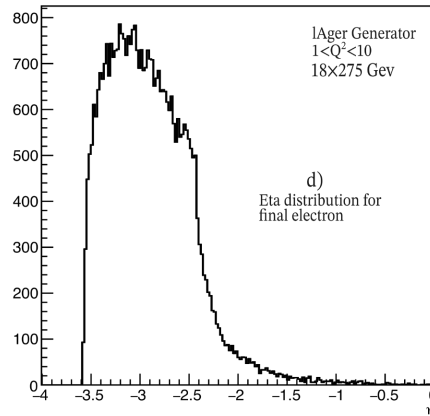
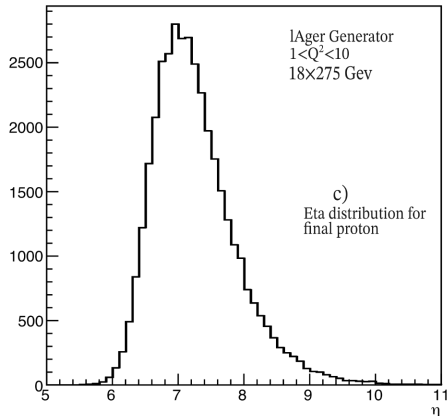
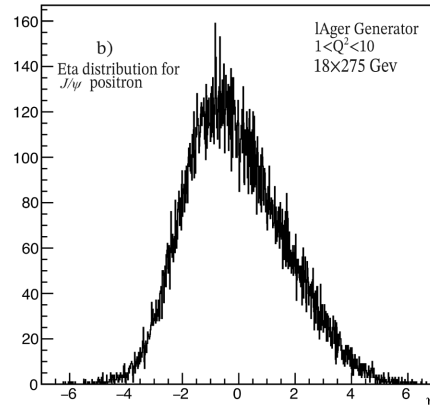
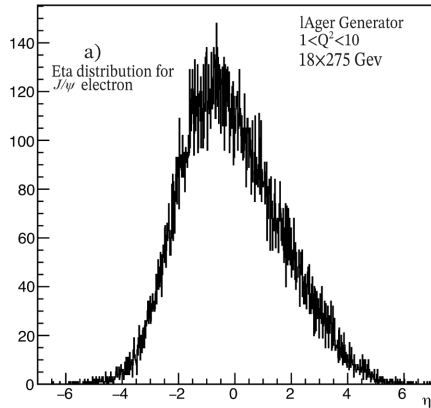


# Motivation

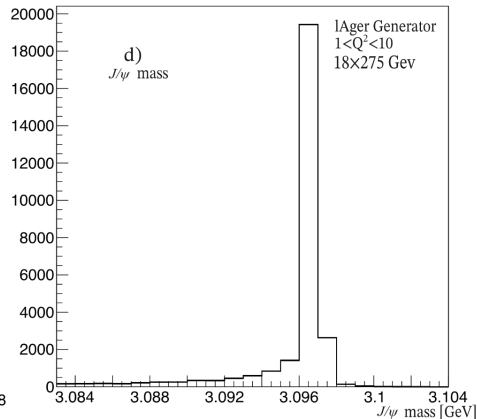
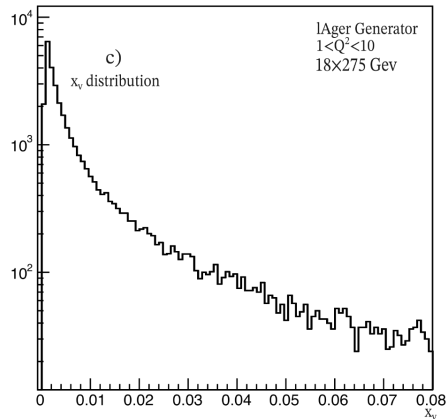
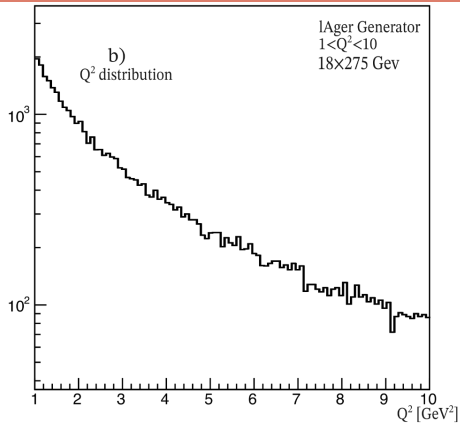
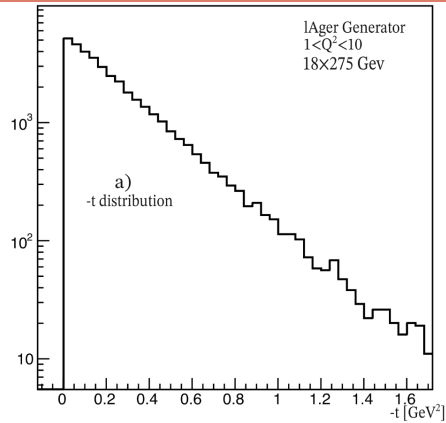


J/ψ production: transverse spatial distribution of gluons

# Generator data



# Generator data



# DVMP analysis data steps

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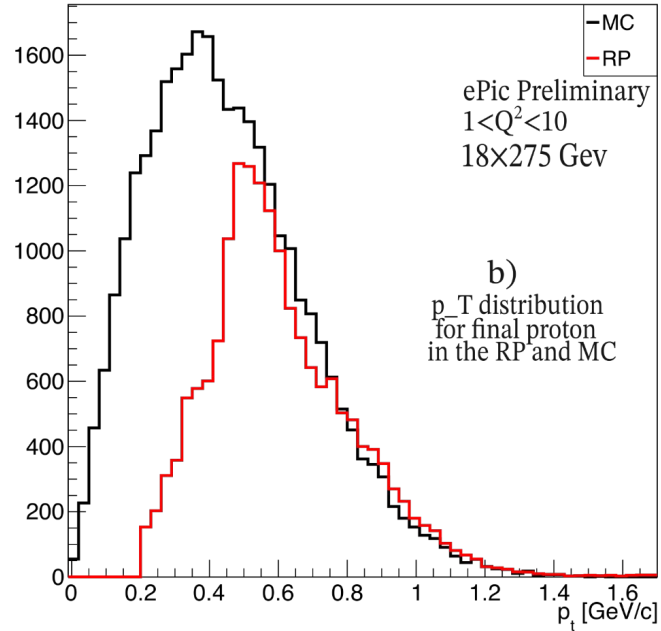
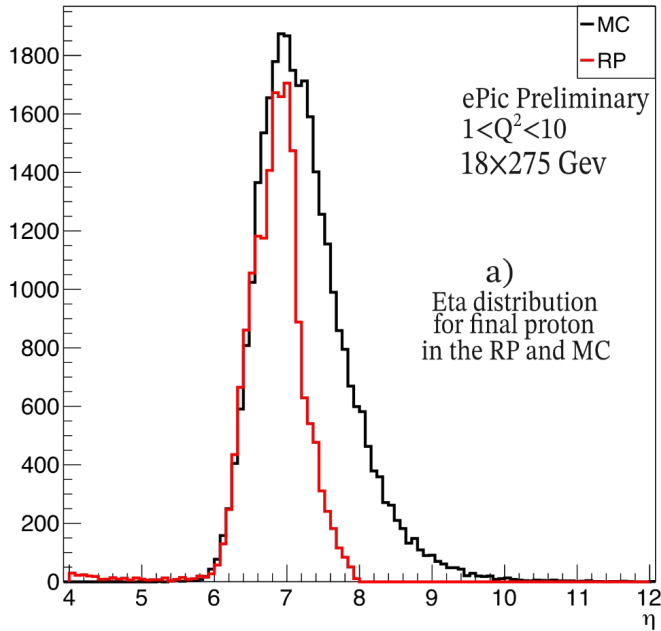
- > Data Generation
- > Afterburned the data
- > DD4hep
- > EICrecon

# DVMP analysis cuts

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- >  $1 < Q^2 < 10$  to all data
- > Placed  $p_T$  cut of 200 MeV on the reconstructed proton
- > Saved all reconstructed electrons in 3 tracks (containing 2 electrons and a positron)
- > Considered all electrons with greater energies/ ( $p_z$ ) momenta and lower eta as the scattered electrons
- > Considered the invariant mass for both scattered and J/Psi electrons to determine which one peaks close to

# DVMP analysis final proton





# DVMP analysis - Distinguishing between scattered and J/Psi electrons

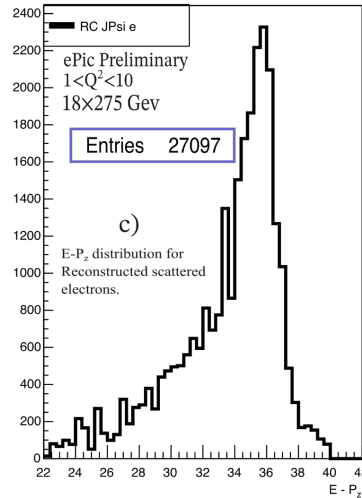
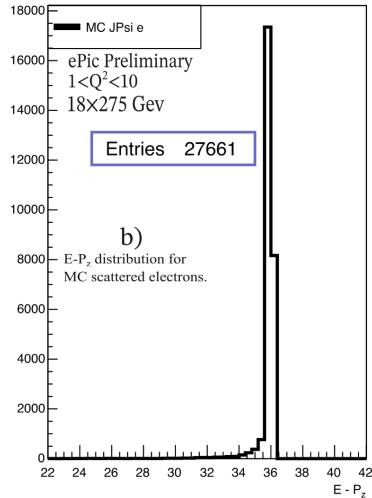
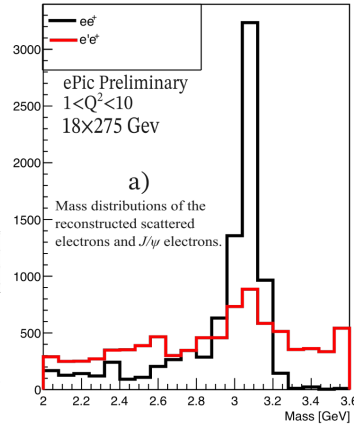
J/ψ(1S) MASS				
VALUE (MeV)	EVTs	DOCUMENT ID	TECH	COMMENT
<b>3096.916 ± 0.011 OUR AVERAGE</b>				
3096.917 ± 0.010 ± 0.007		AULCHENKO 03	KEDR	e <sup>+</sup> e <sup>-</sup> → hadrons
3096.89 ± 0.09	502	<sup>1</sup> ARTAMONOV 00	OLYA	e <sup>+</sup> e <sup>-</sup> → hadrons
3096.91 ± 0.03 ± 0.01		<sup>2</sup> ARMSTRONG 93B	E760	$\bar{p}p \rightarrow e^+e^-$
3096.95 ± 0.1 ± 0.3	193	BAGLIN 87	SPEC	$\bar{p}p \rightarrow e^+e^- X$

$$\Sigma = \sum_h (E_h - p_{z,h})$$

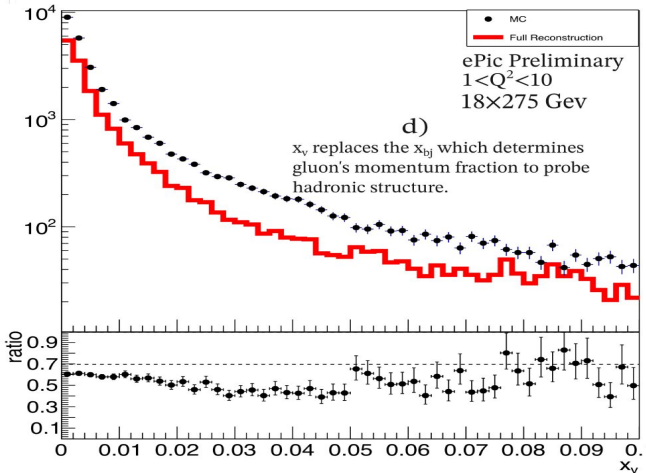
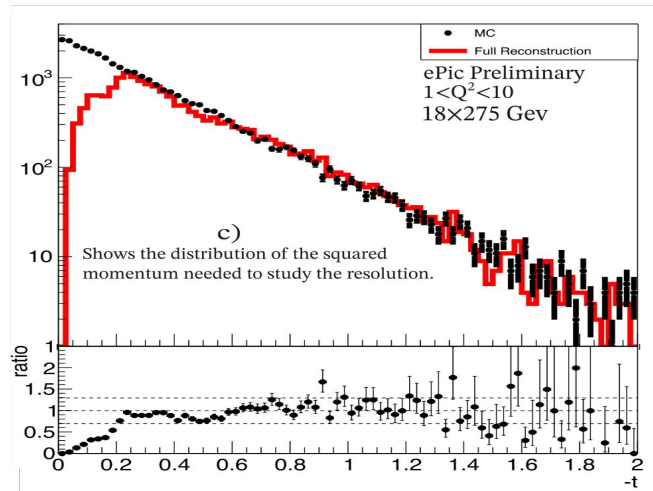
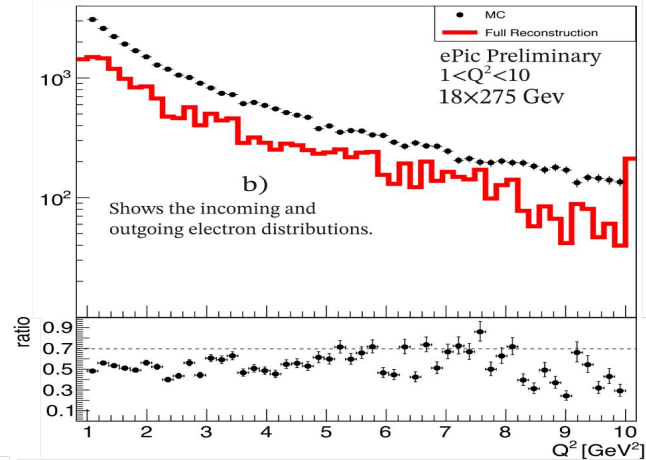
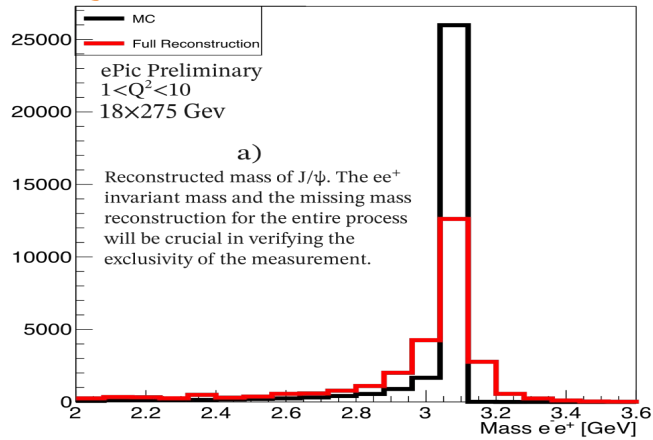
$\Rightarrow \Sigma E_e \approx \Sigma p_{z,e} = E_e(1 - \cos\theta) + \Sigma (E_{h+} p_{z,h+})$   
 If  $\theta \approx \pi$ :  $\Sigma E_e = \Sigma (E_{h+} p_{z,h+}) \rightarrow$  for scattered  $e^-$  electrons clear enough to be seen (in  
 If  $\theta \approx 0$ :  $\Sigma E_e = E_e + \Sigma (E_{h+} p_{z,h+}) \rightarrow$  for a transverse scattering

$$\text{Eff.} = \frac{27097}{27661}$$

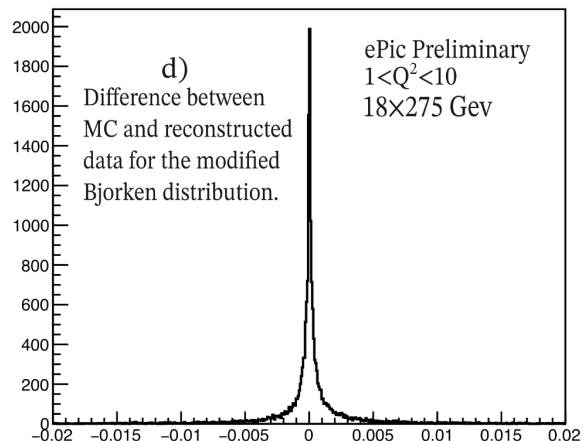
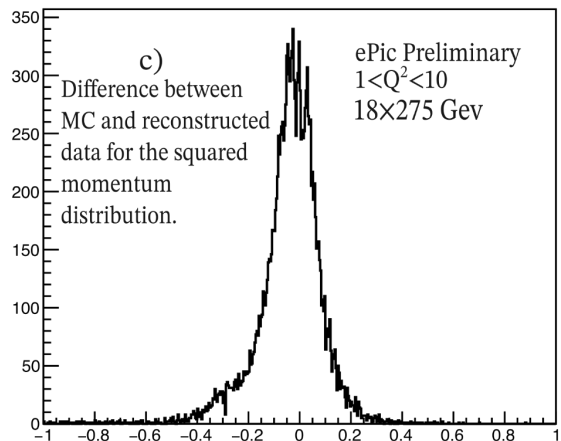
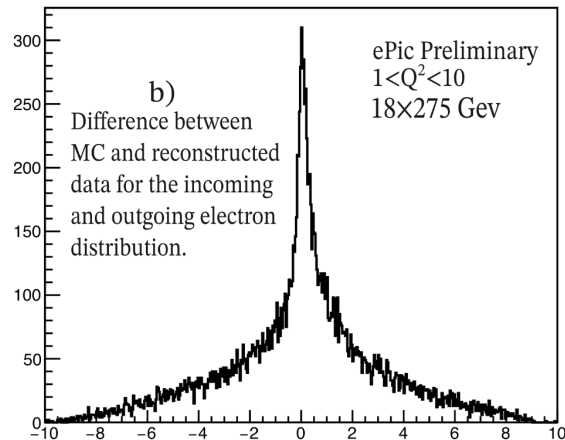
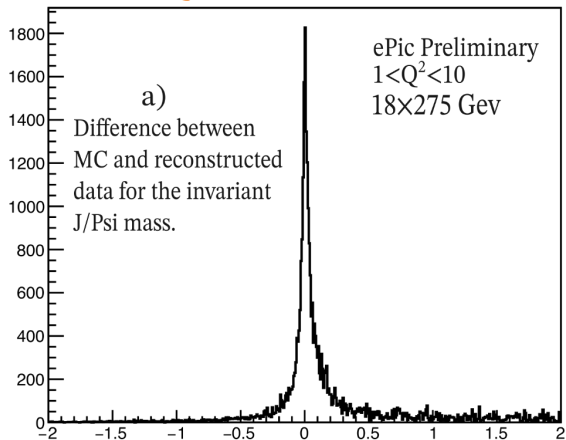
U. Bassler and Bernardi, NIM A361 (1995) 197.



# DVMP analysis - Kinematic variables reconstruction



# DVMP analysis - Measure of Resolution



**Thank You**