

E/p from J/Psi and Z

Detector Simulation meeting

September 23, 2004

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- ✓ Electron Samples
J/Psi, Z

Electron Samples (Z and J/Psi)

Z (Data 5.3.1, MC 5.3.3)

- Loose Z dielectron sample
- ~0.5 M candidates
- ~200 pb⁻¹ (2/4/2002 – run 180000(?)
- Pythia (Zee+Min bias) + 5.3.3
- EWK group (zewkae) sample

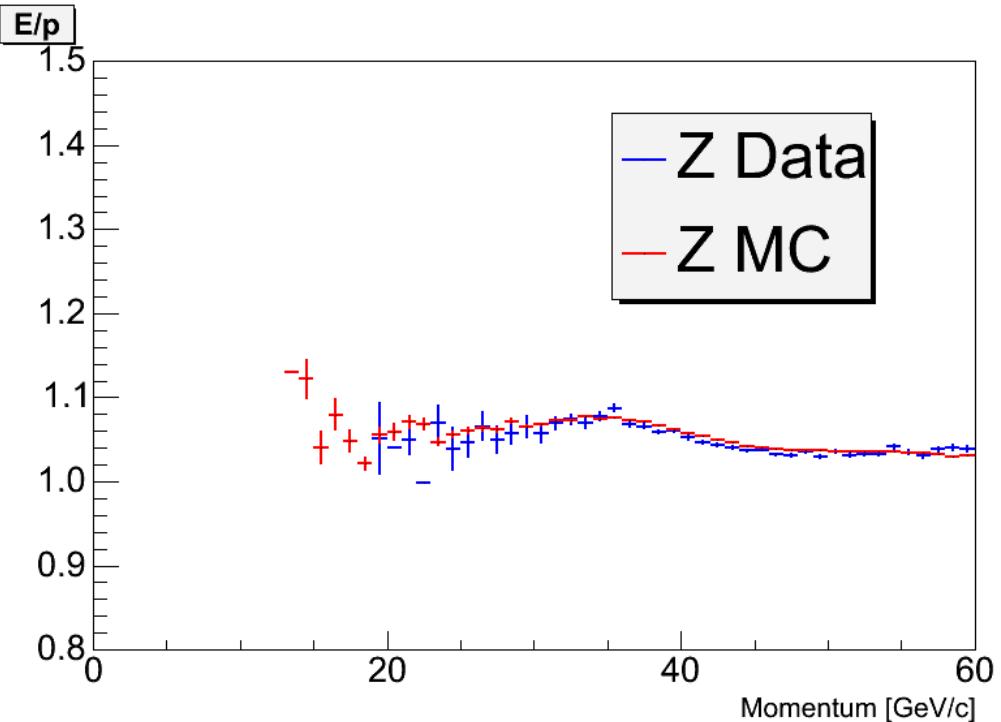
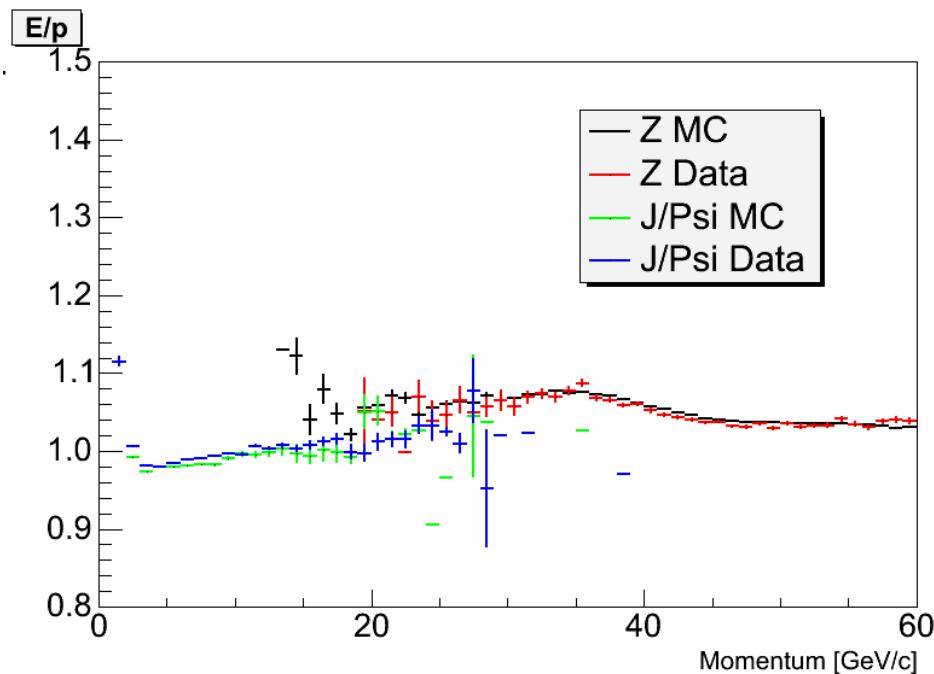
J/Psi (Data 5.3.1, MC 5.3.1)

- J/Psi dielectron trigger
- Run < 180000
- Triggers : Et>2 and Pt>2
- MC : Bgen + 5.3.1 SIM+REC
- ~110 k reconstructed events

Electron Selections

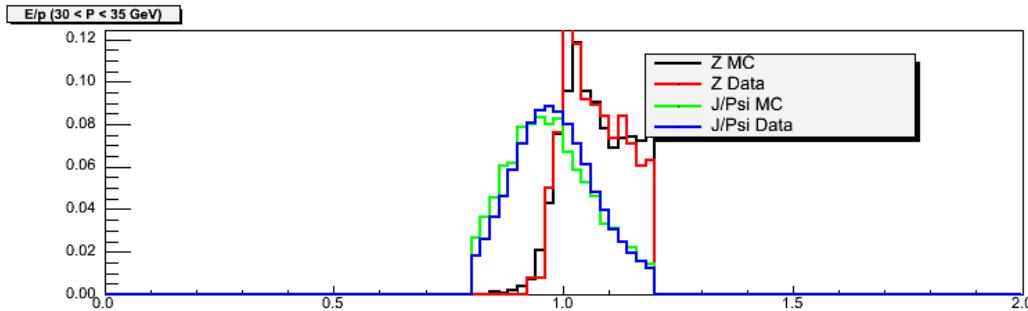
- $E/p < 2.0$ ($0.8 < E/p < 1.2$ for E/p)
 - $\text{Had}/\text{em} < 0.055 + 0.00045 * \text{energy}$
 - $\text{IsoEt}/\text{Et} < 0.15$ (0.1 for Z)
 - Ces Strip $\chi^2 < 10$
 - $\Delta Z < 3.0$
 - $-3.0 < Q * \Delta X < 1.5$
 - Number of matched track = 1
-
- $82 < M(Z) < 100 \text{ GeV}/c^2$
 - $2.5 < M(J/\Psi) < 3.5 \text{ GeV}/c^2$
 - $75 < M(Z) < 105 \text{ GeV}/c^2$ for PPR/PEM

J/Psi and Z E/p vs p

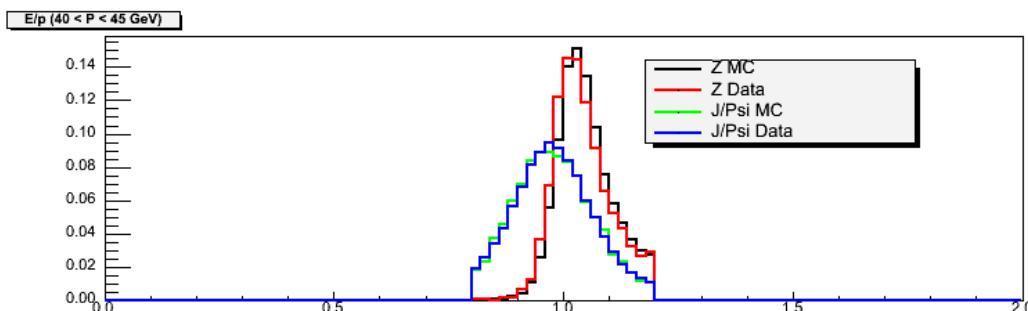


Good agreement between data and MC for most momentum ranges
➤ Need to understand underlying energy, especially in the low momentum region ($p < 5$)

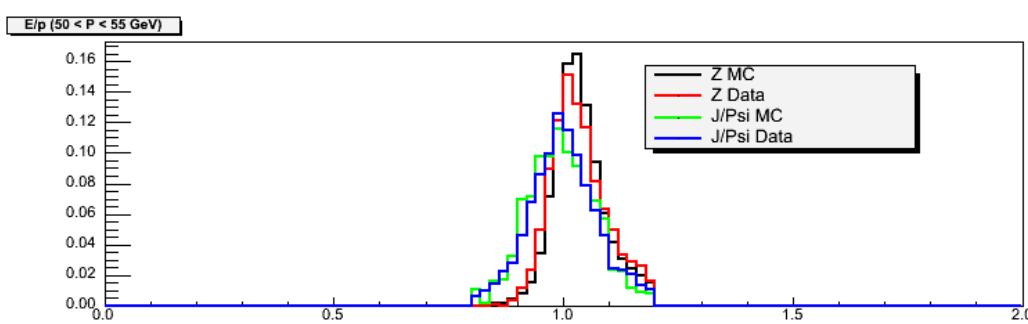
E/p Z and J/Psi



J/Psi : $3 < p < 4$ GeV/c
Z : $30 < p < 35$ GeV/c



J/Psi : $4 < p < 6$ GeV/c
Z : $40 < p < 45$ GeV/c



J/Psi : $10 < p < 15$ GeV/c
Z : $50 < p < 55$ GeV/c

Difference of EM Responses between Data and MC

momentum	p(Data, MC)	E/p (Data-MC)	E/p(Data-MC)/Data	
• $20 < p < 30$	(27.3, 26.9)	-0.0079	$\pm \pm$ (0.76%)	Z
• $20 < p < 30$	(22.5, 23.1)	-0.0082	(0.81%)	J/Psi
• <u>$30 < p < 35$</u>	<u>(33.1, 33.1)</u>	<u>-0.0021</u>	<u>(0.21%)</u>	
• $40 < p < 45$	(42.6, 42.6)	-0.0061	(0.58%)	
• <u>$50 < p < 55$</u>	<u>(52.3, 52.3)</u>	<u>-0.0011</u>	<u>(0.11%)</u>	
• <u>$3 < p < 4$</u>	<u>(3.46, 3.49)</u>	<u>0.0078</u>	<u>(0.80%)</u>	
• $4 < p < 6$	(4.77, 4.89)	0.00060	(0.06%)	
• <u>$10 < p < 15$</u>	<u>(11.5, 11.5)</u>	<u>0.00414</u>	<u>(0.41%)</u>	