

EM Radiative Corrections

➔ Based on Hall A Monte Carlo (HAMC)

➔ Prerequisites:

- ◆ Radiation: Internal/External Bremsstrahlung, Ionization....
- ◆ Acceptance
- ◆ Simulation checked with data

➔ Inputs:

■ DIS: calculated using PDF fits (MRST/CTEQ).

■ Elastic ■ Quasi-Elastic : Data/Theoretical calculations

Resonance:

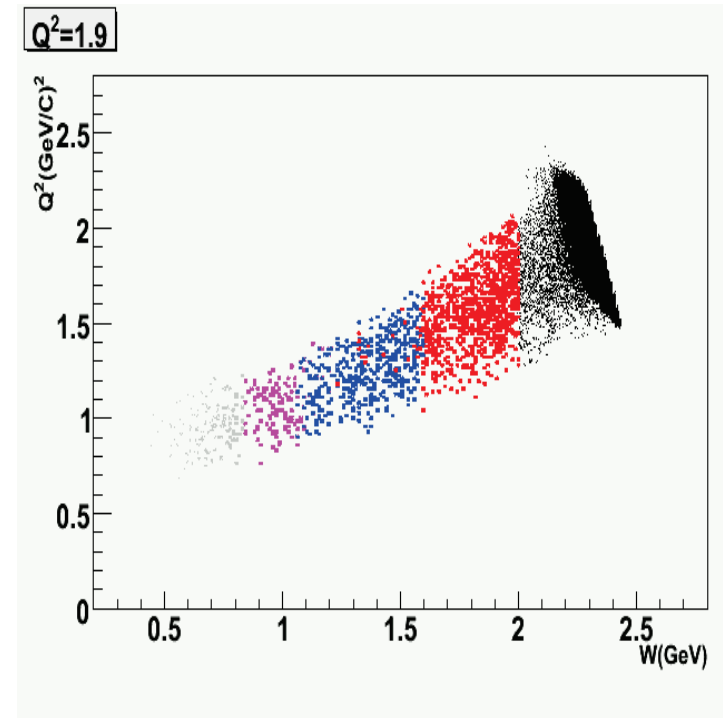
Some calculation (Misha Gorshteyn), which covers a large part of the resonance

■ Delta Resonance: Theoretical calculation (Lee & Tao).

■ Other Resonance: No previous data

“Toy Model”, eg.
$$A_{toy} = A_{dis} \times \frac{\sigma_{res}}{\sigma_{dis}}$$

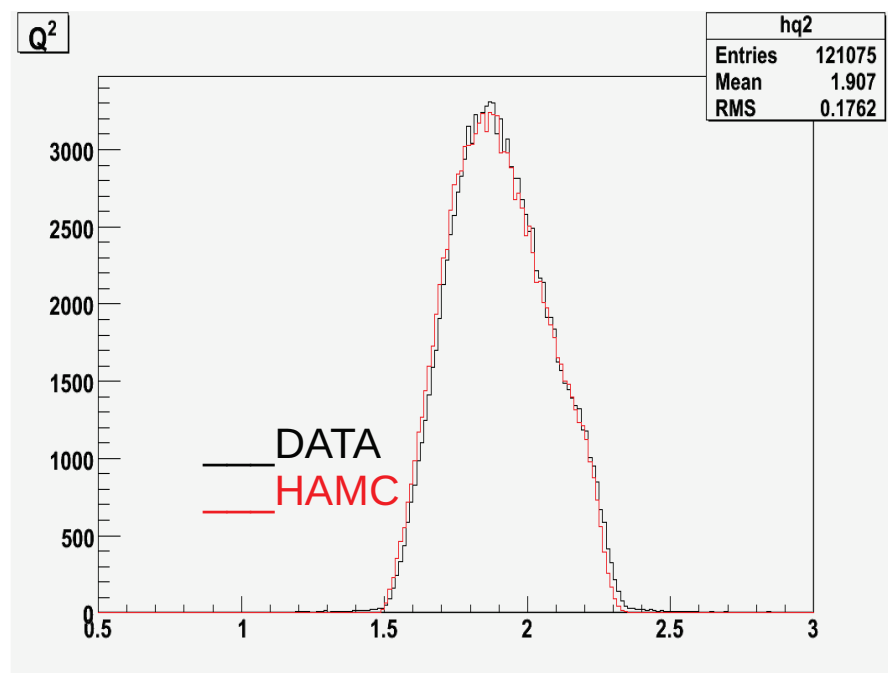
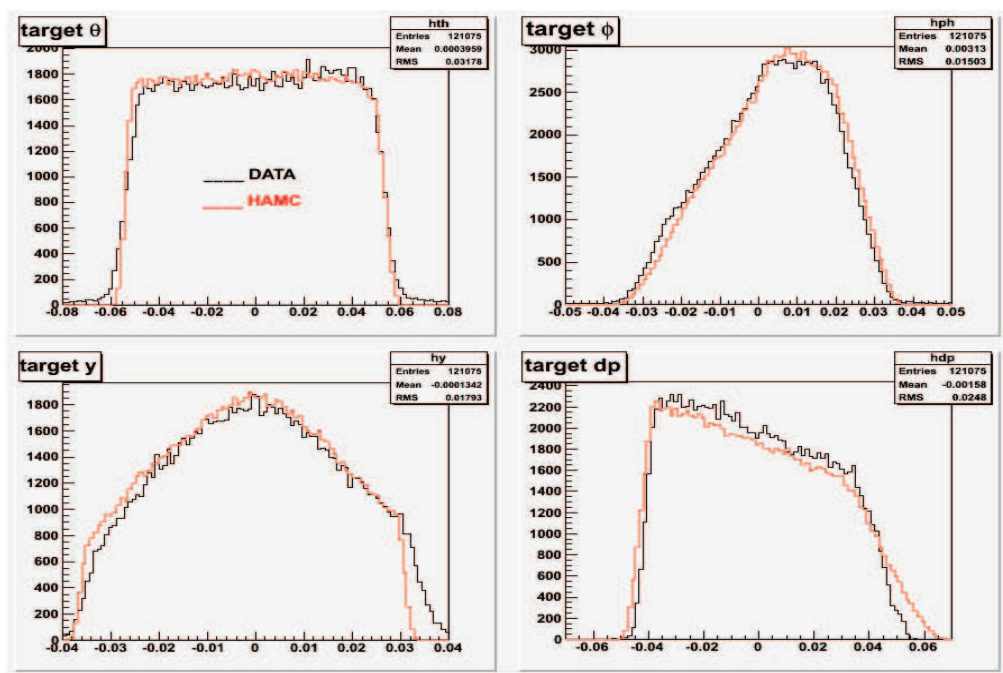
Use resonance data to constrain uncertainties.



Hall A Monte Carlo

A Monte Carlo simulation package developed to simulate the physics.

Basic checks of HAMC:

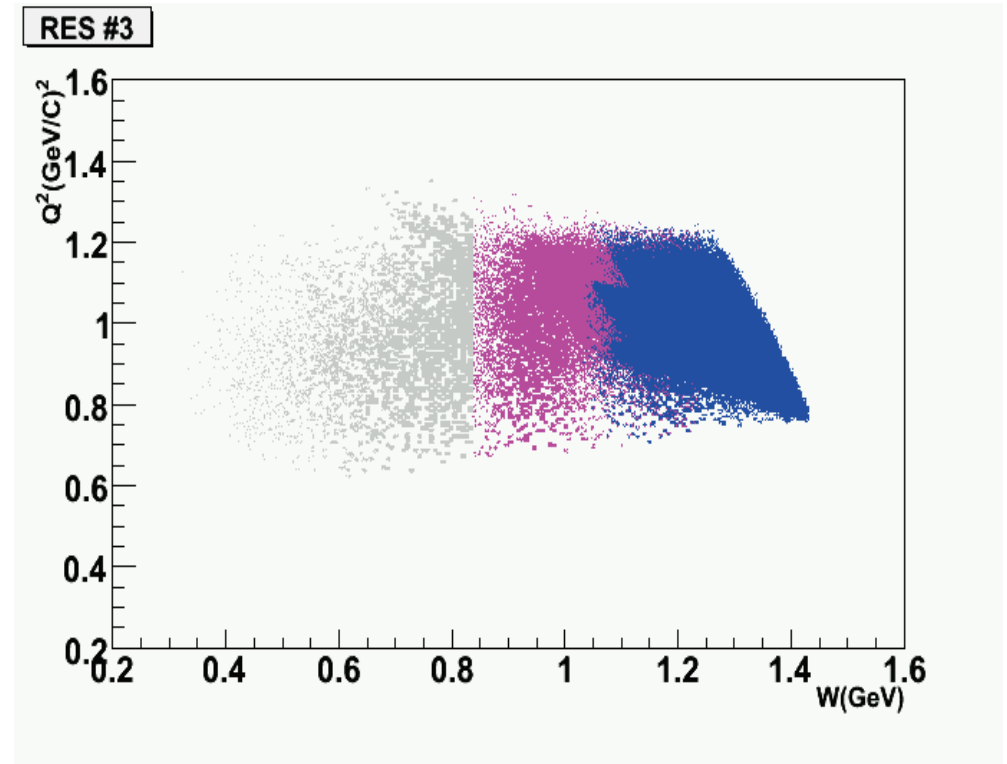
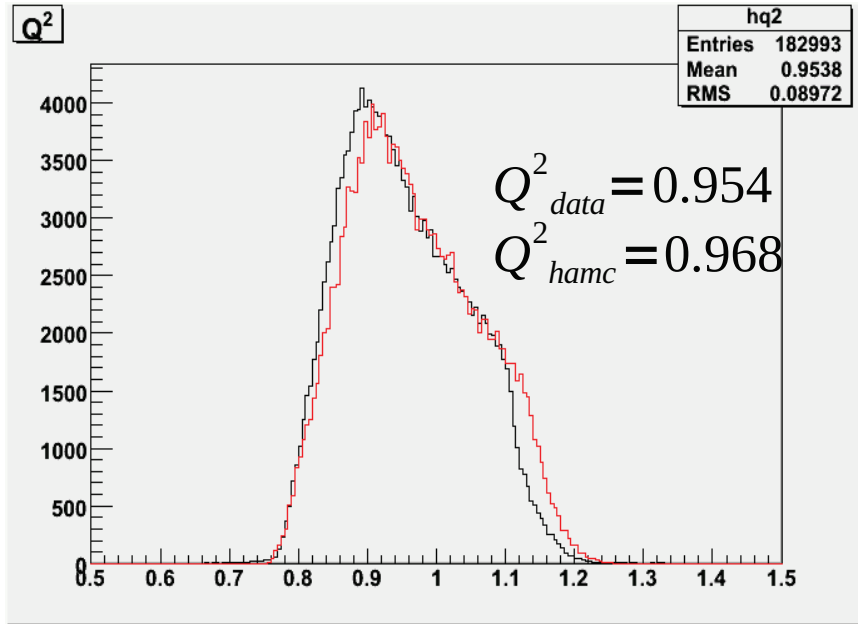


$$Q^2_{data} = 1.907$$

$$Q^2_{hamc} = 1.896$$

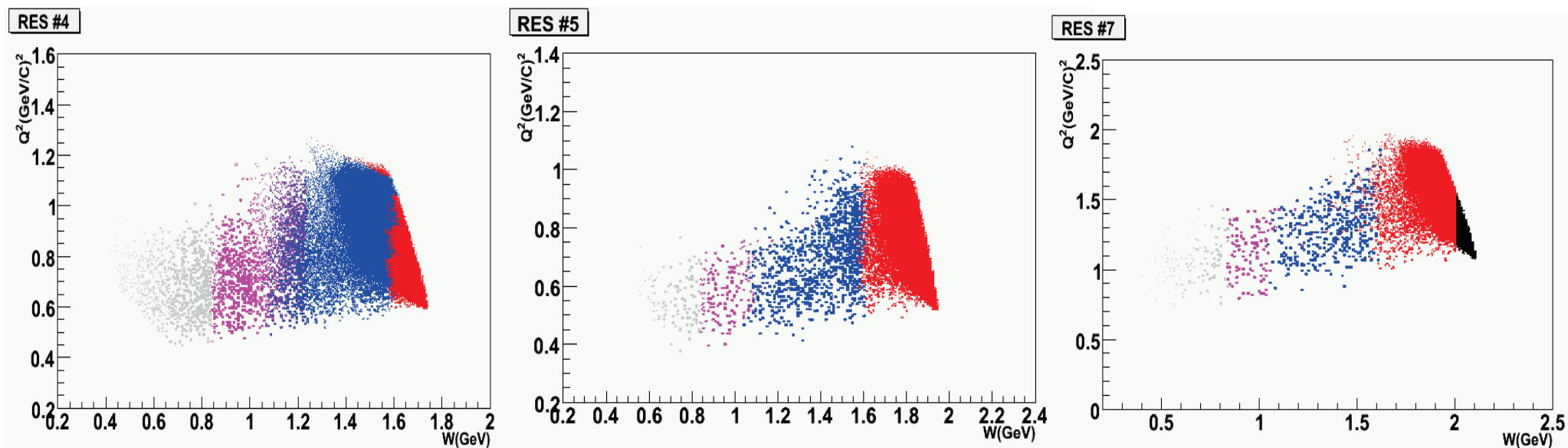
Res #3 / Delta Resonance

(Magnets Mistuned)



	Elastic	Quasi	Table	Dis	Toy	<Asym>	Data
Lee&Tao	80.2 (0.15%)	-46.4 (12.5%)	-89.3 (87.4%)	0	0	-83.66(ppm)	66.258 +/-7.768 (ppm)
Misha	80.2 (0.15%)	-45.5 (28.7%)	-88.8 (43.5%)	0	-60.2 (27.5%)	-68.18(ppm)	

Resonance #4,5,7 / Toy Model



	Elastic	Quasi	Delta	Dis	Toy	<Asym>	Data
Res #4	54.9 (0.04%)	-25.6 (1.7%)	-67.0 (72.2%)	0	-62.7 (26.1%)	-65.2 (ppm)	-73.4+/-6.9 (ppm)
Res #5	43.8 (0.02%)	-18.9 (1.3%)	-55.2 (3.7%)	0	-59.7 (95.0%)	-59.0 (ppm)	-60.9 +/- 5.15 (ppm)
Res #7	86.4 (0.04%)	-47.5 (0.8%)	-101.2 (1.6%)	-105.6 (21.7%)	-120.7 (75.9%)	-116.4 (ppm)	-118.8 +/- 16.9 (ppm)