

Inclusive Electron Rates from Peter Bosted Fit* and its comparison with current model**

Ziheng

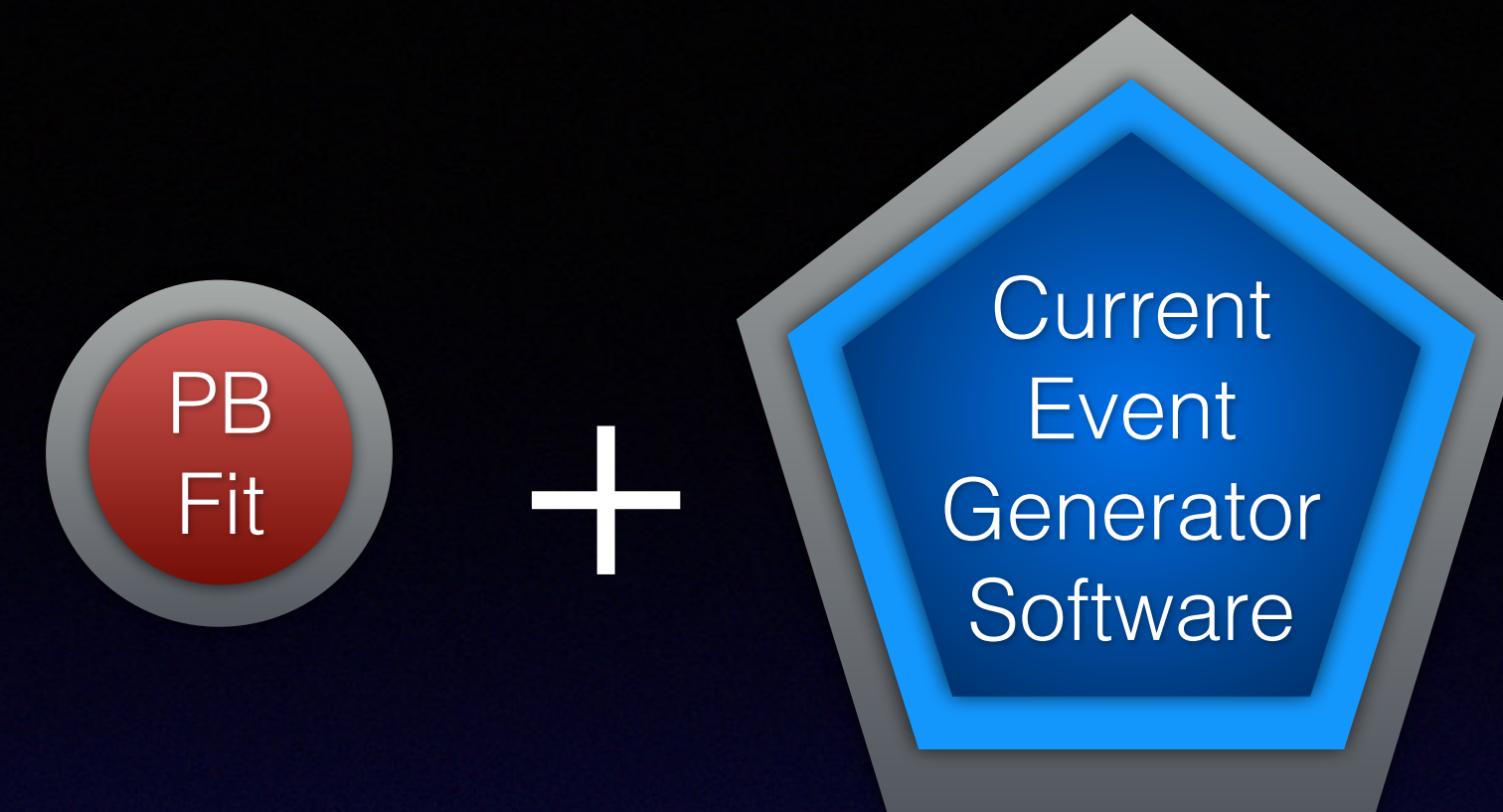
*Referred as “PB” in this report

**Current model used in electron events generator, based on theory and cteq6 PDF fit, referred as “DIS” in this report

Outline

1	Transplant Peter Bosted fit to current software, an event generator.	Successful
2	Compare simulation results from PB fit and current model (“DIS”)	Notable difference
3	Search for the source of discrepancy	Just started

1. Transplant PB fit to current Event Generator



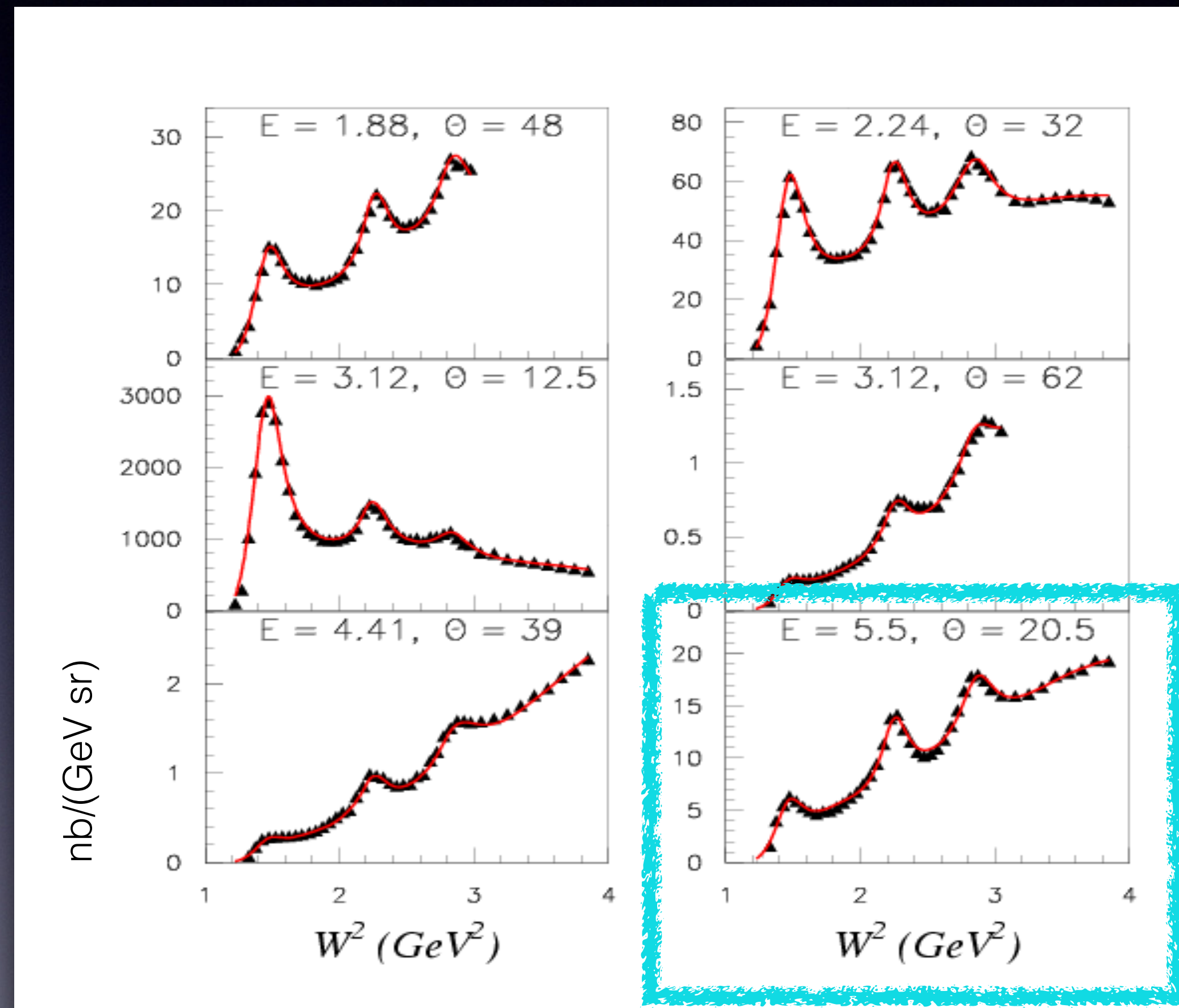
2. Simulate inclusive events, using different nucleus



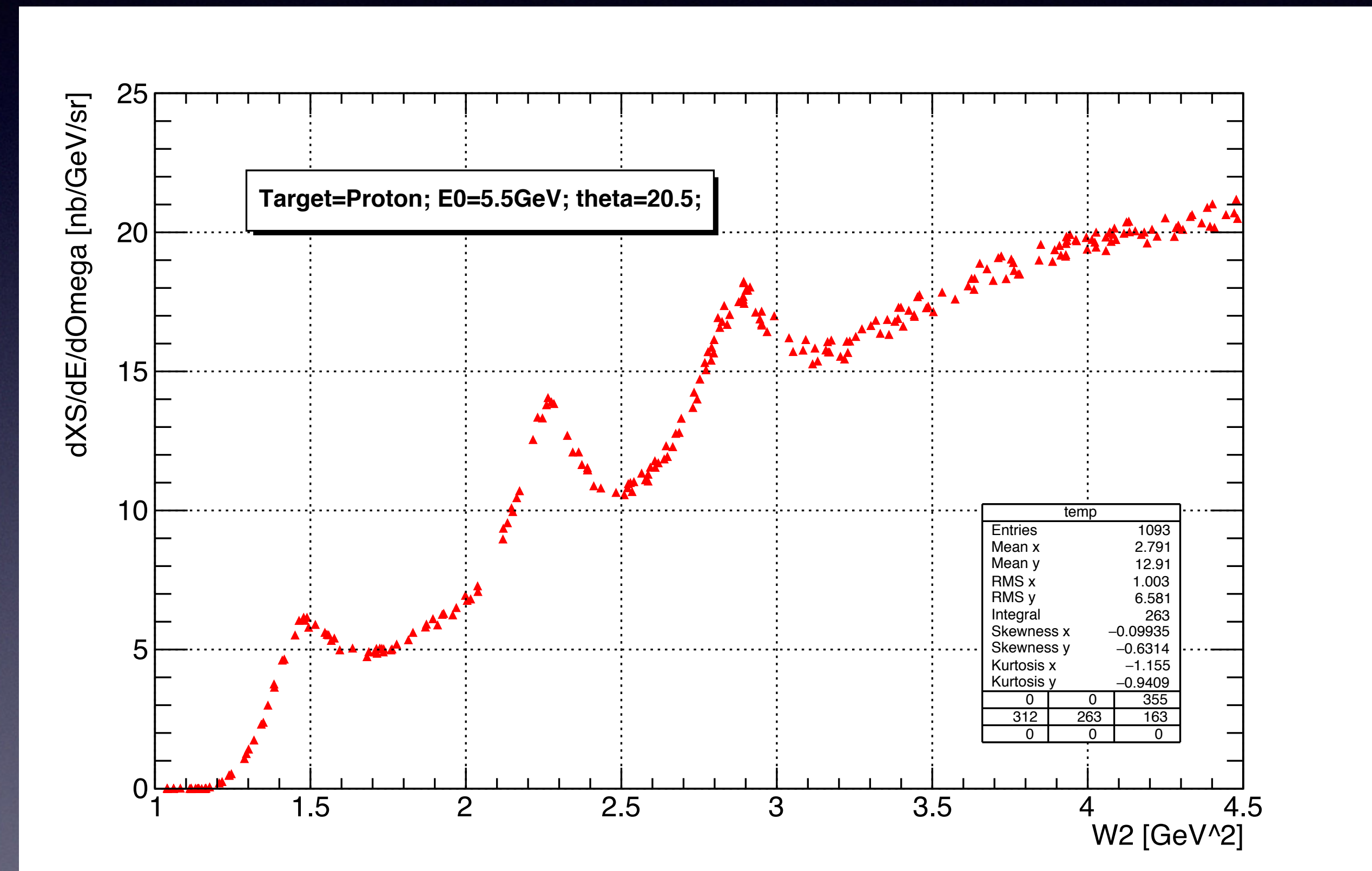
3. Compare produced simulation with data, to verify the software developing.



Proton Target

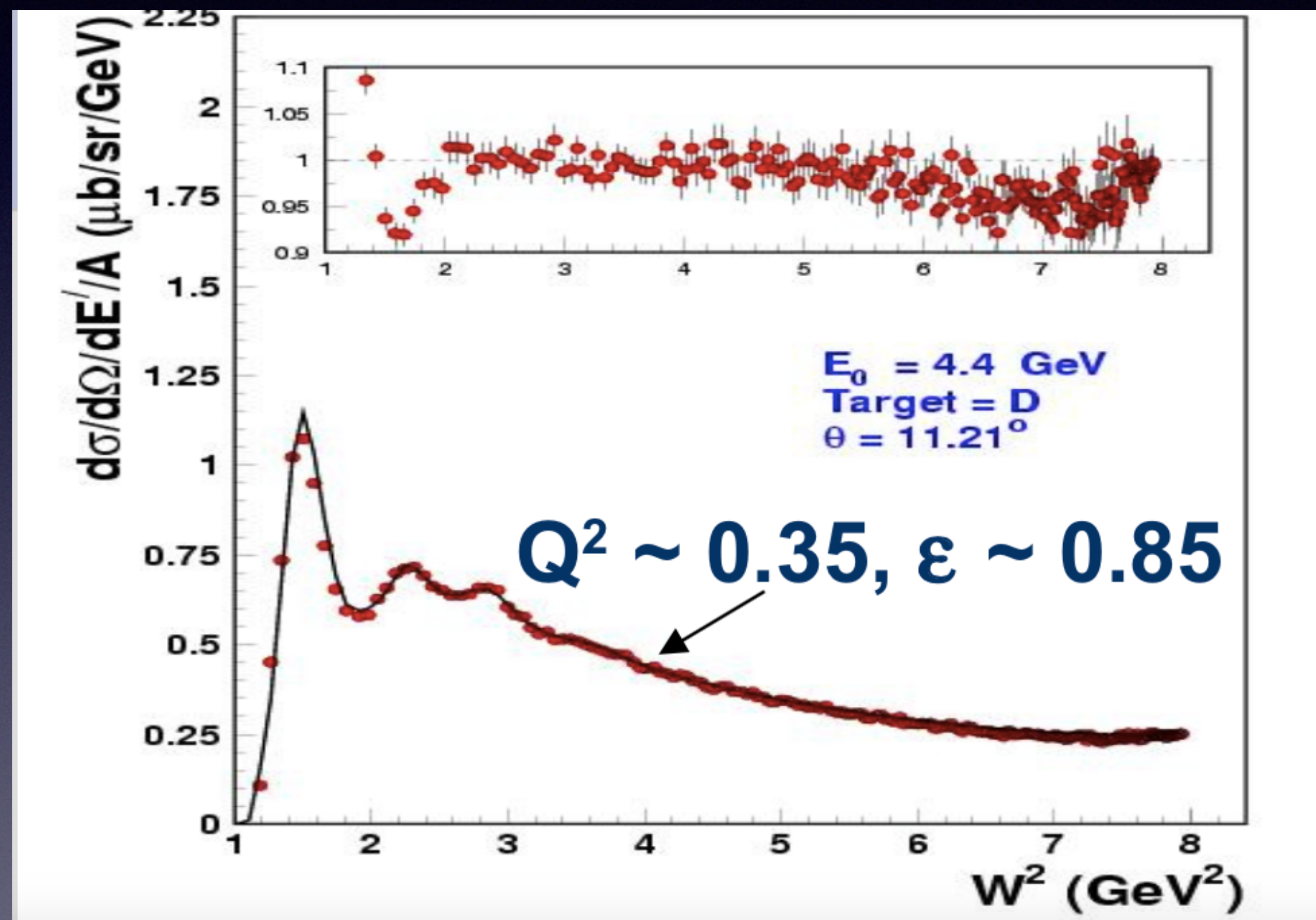


Data (JLab E94-110)

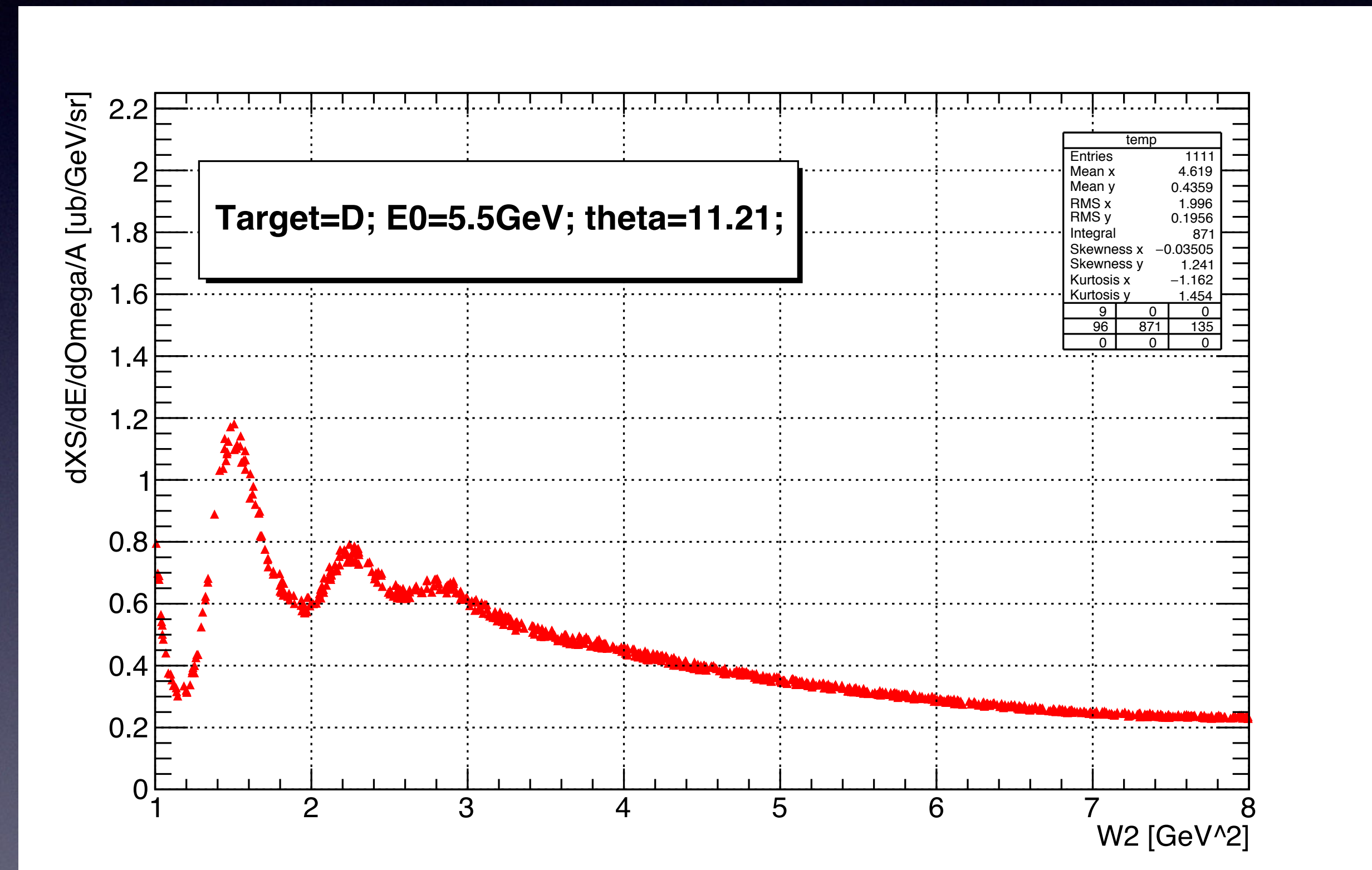


Data from EventGenerator_PB

Deuteron Target

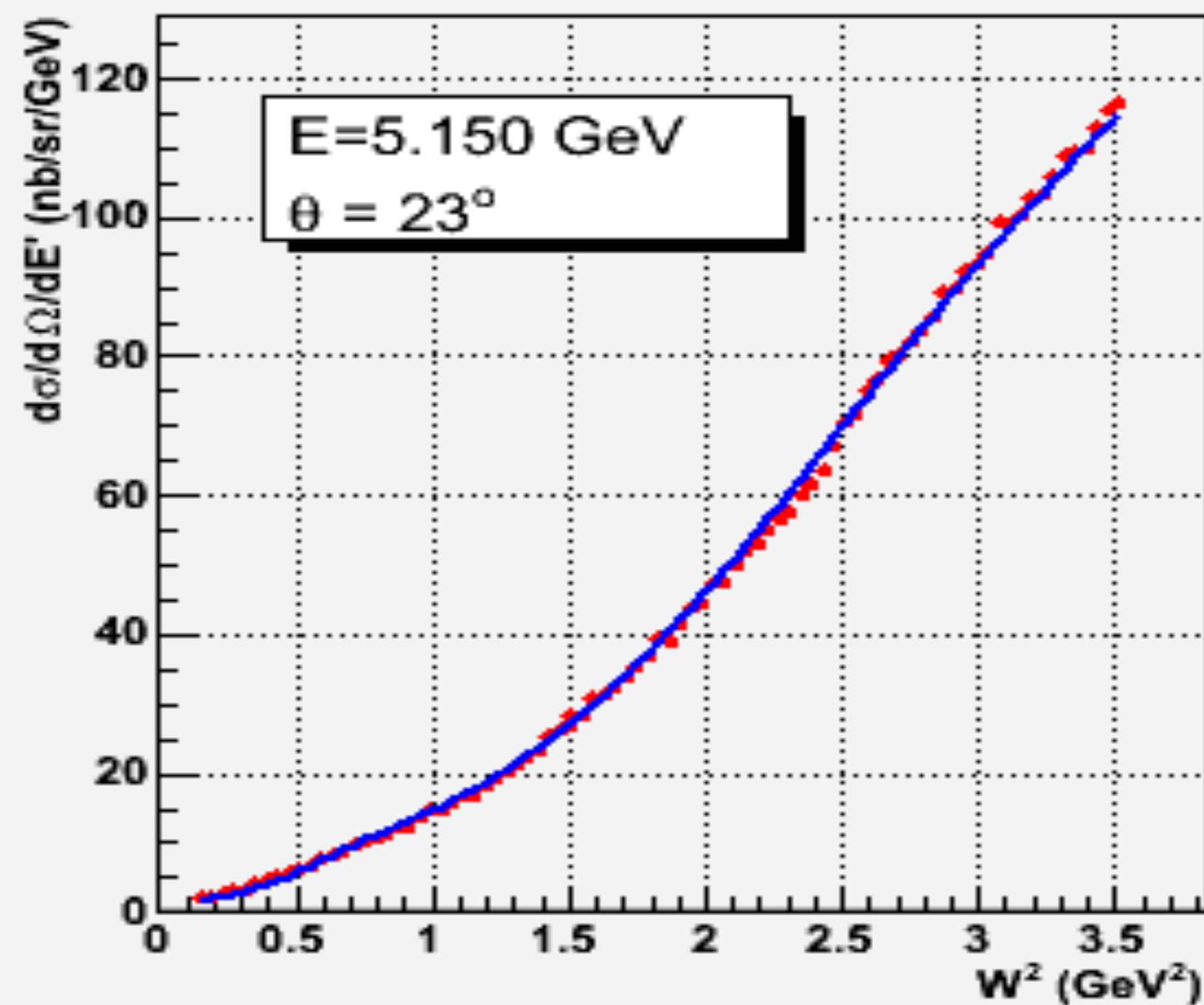


Data (JLab E00-002)

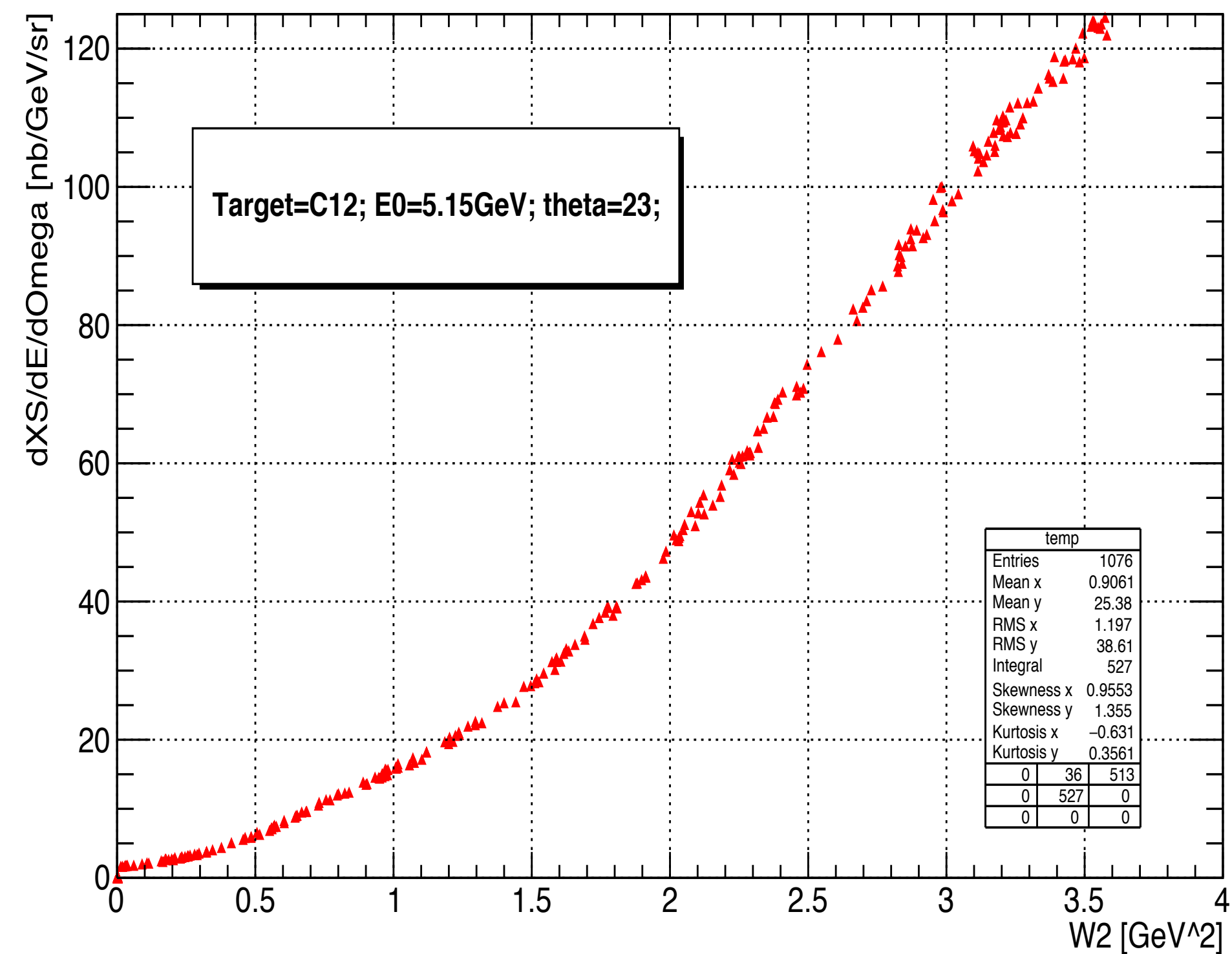


Data from EventGenerator_PB

Carbon Target

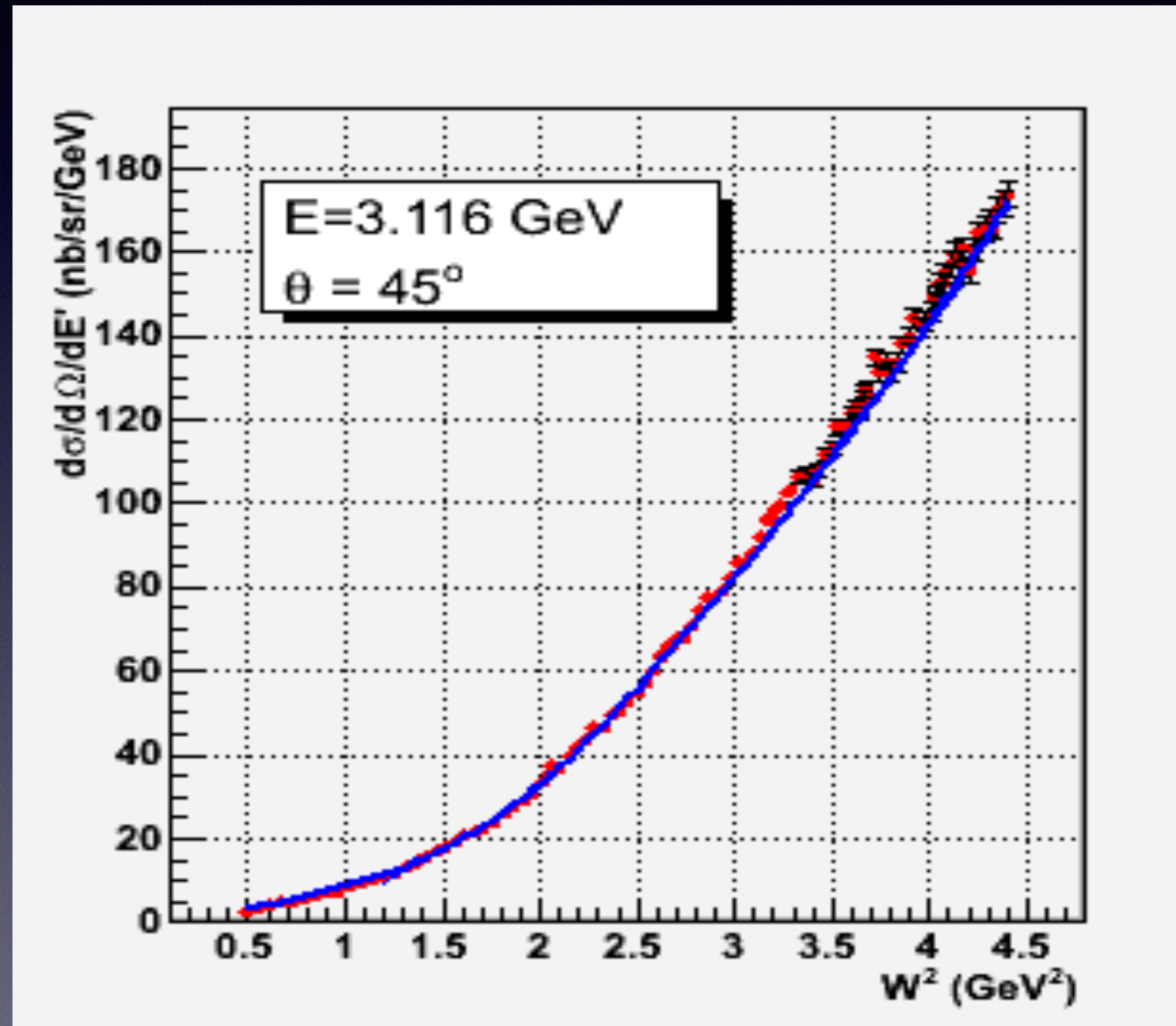


Data (JLab E06-109)

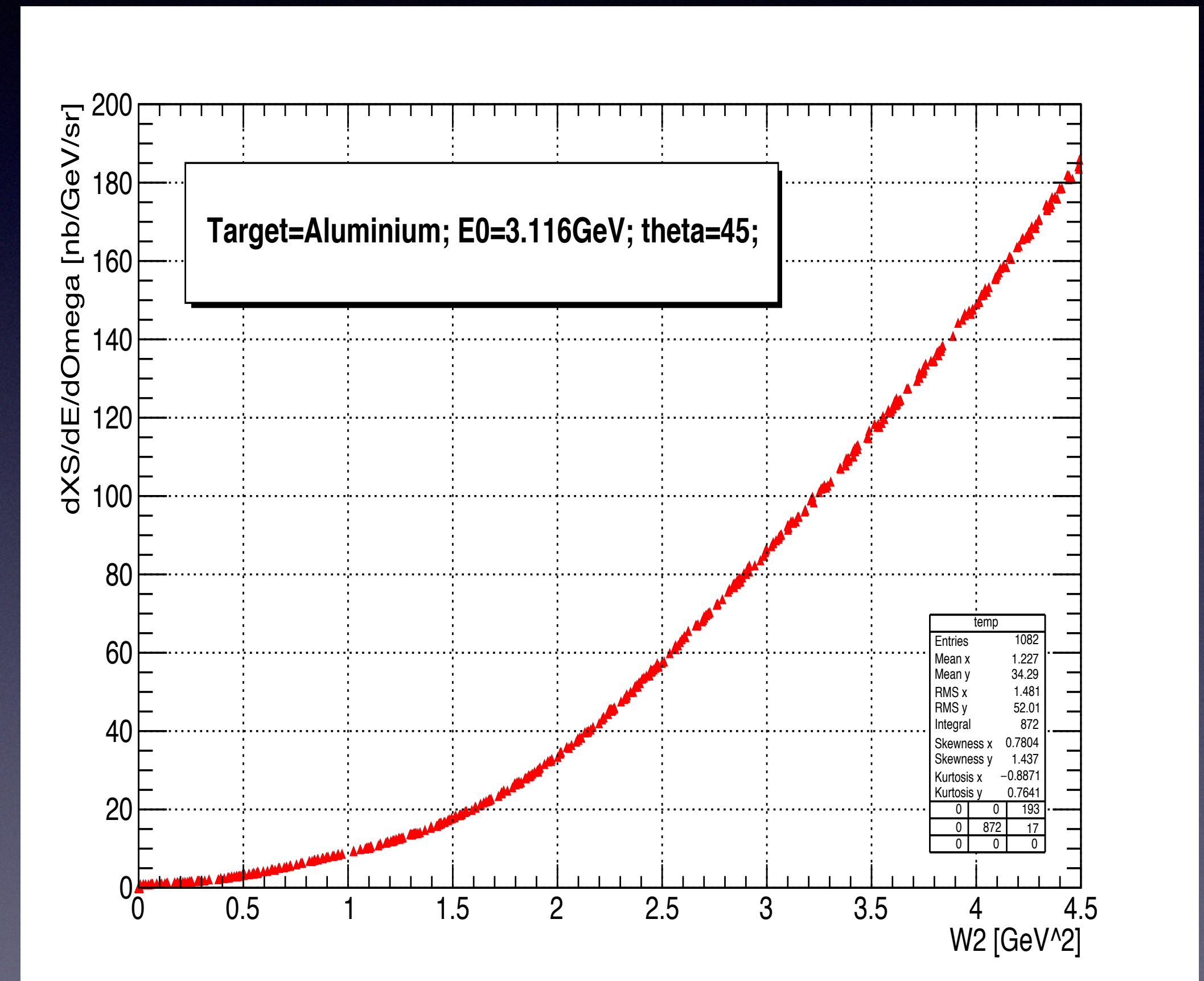


Data from EventGenerator_PB

Aluminum Target

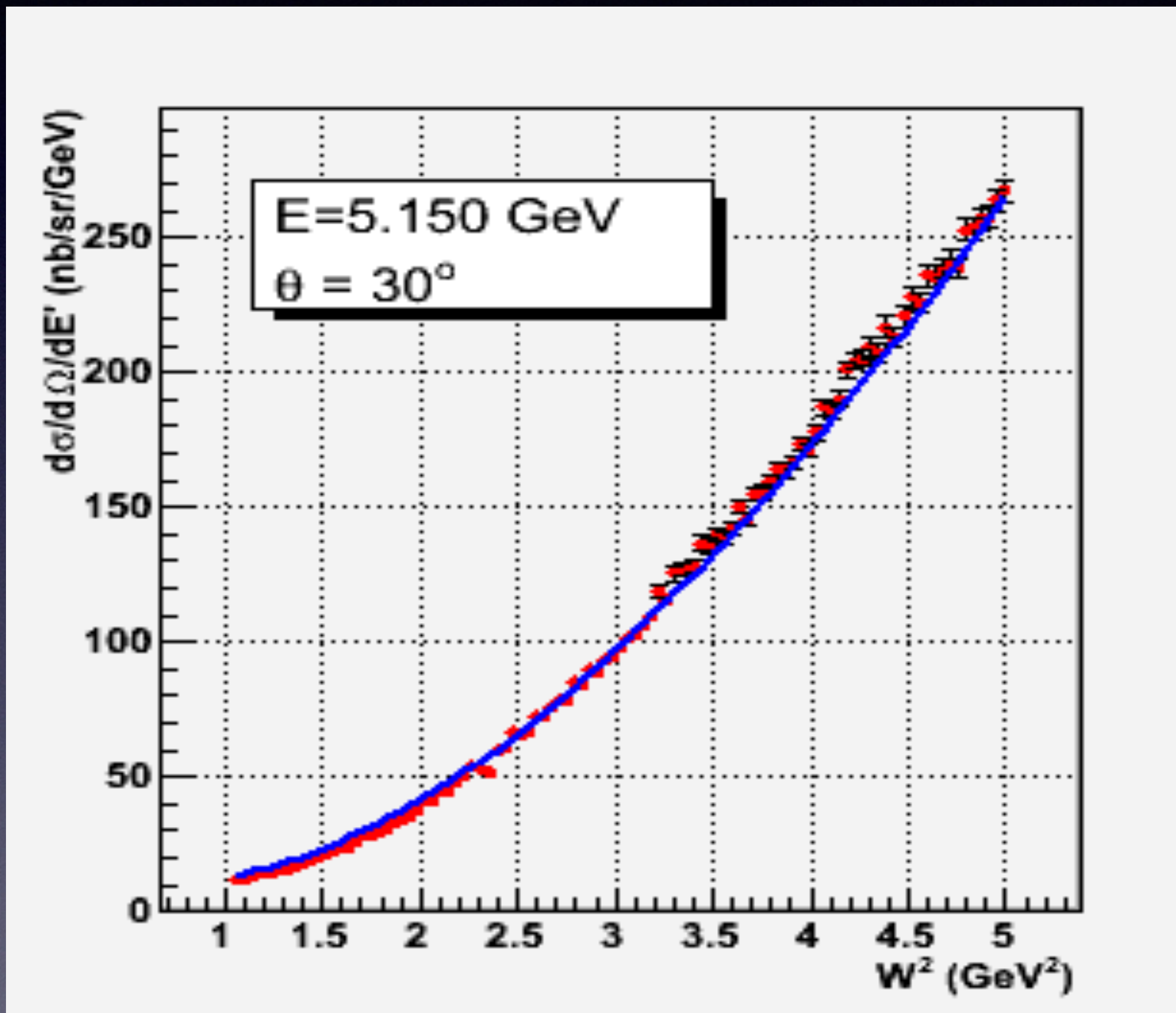


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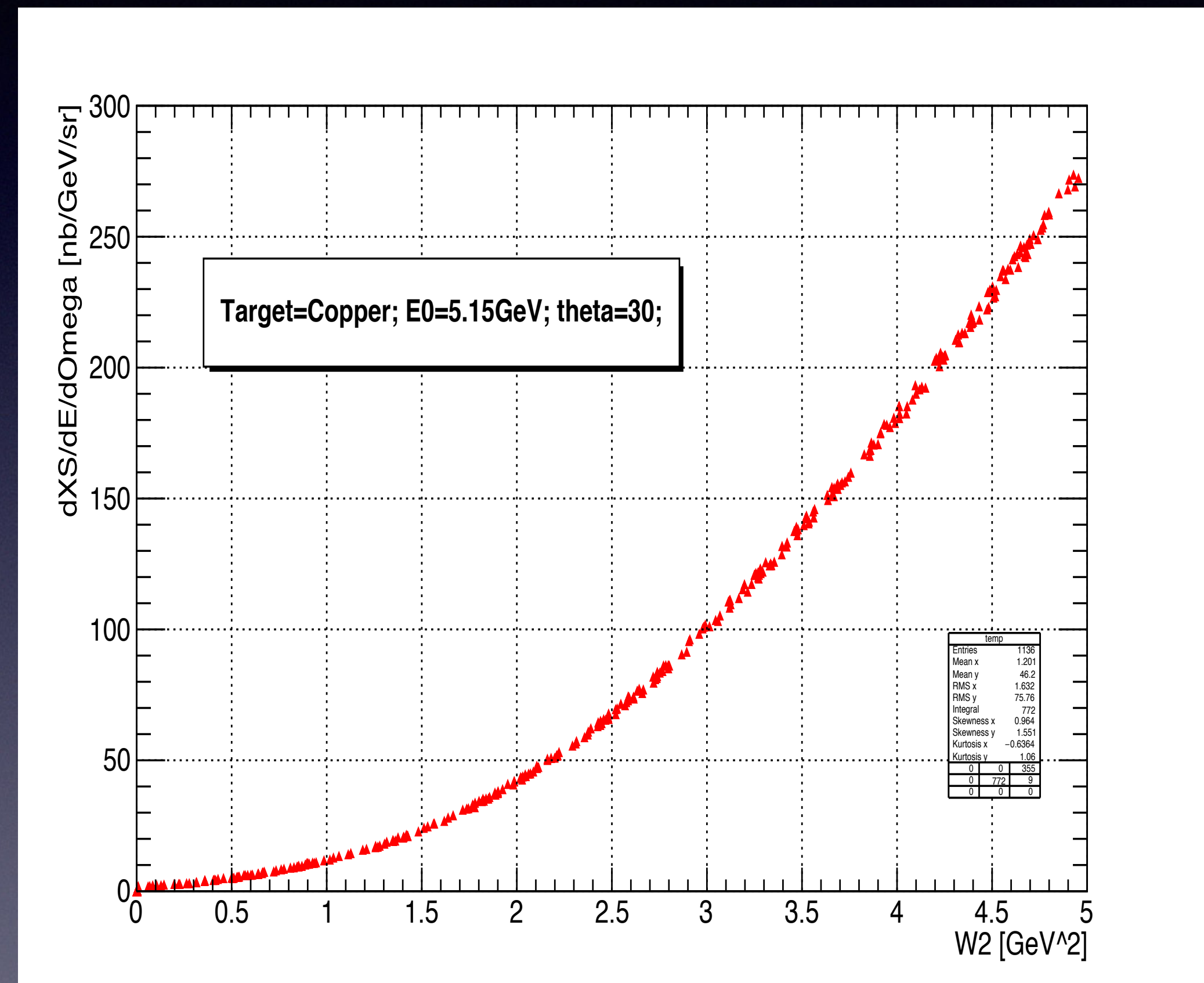


Data from EventGenerator_PB

Copper Target

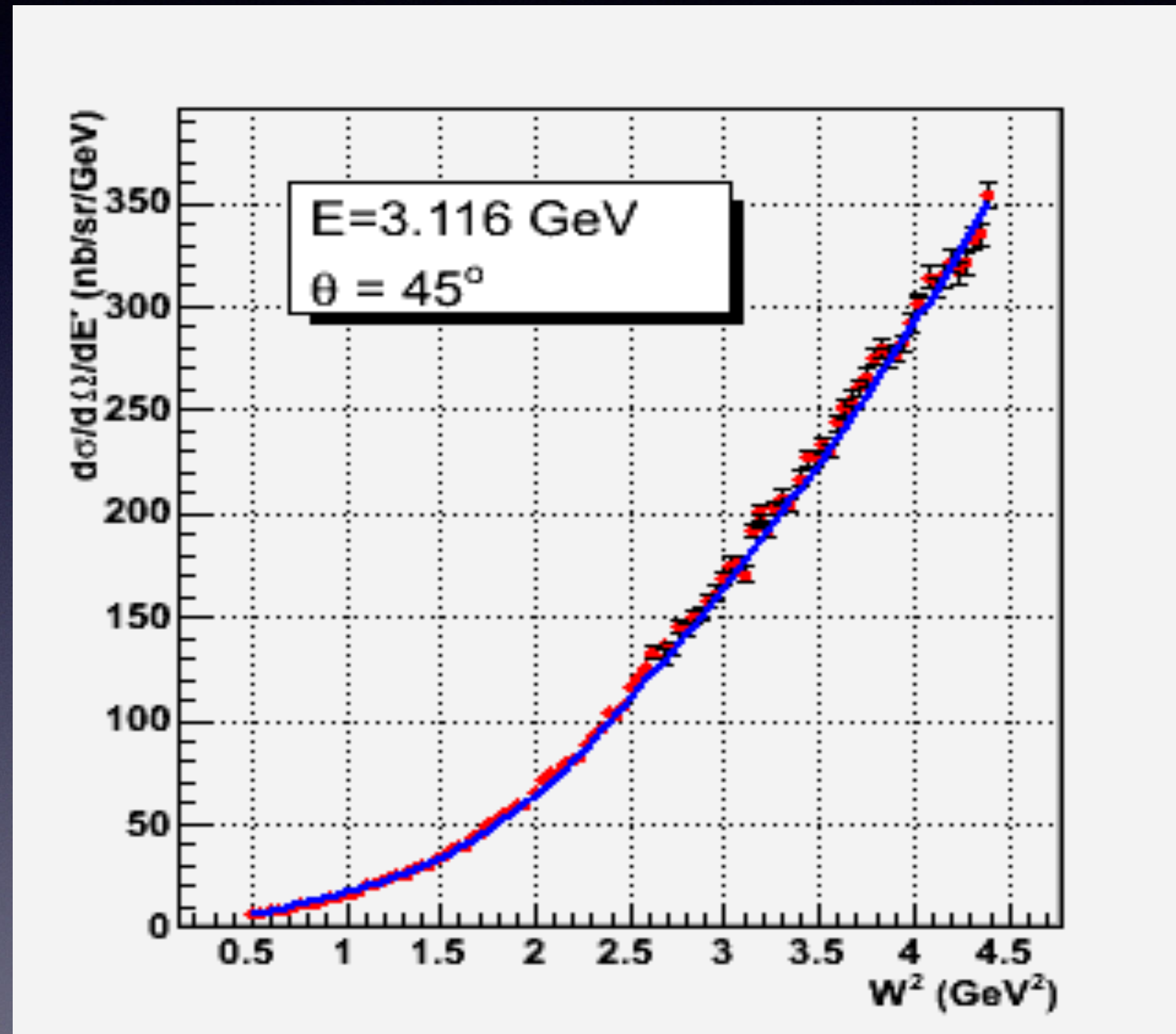


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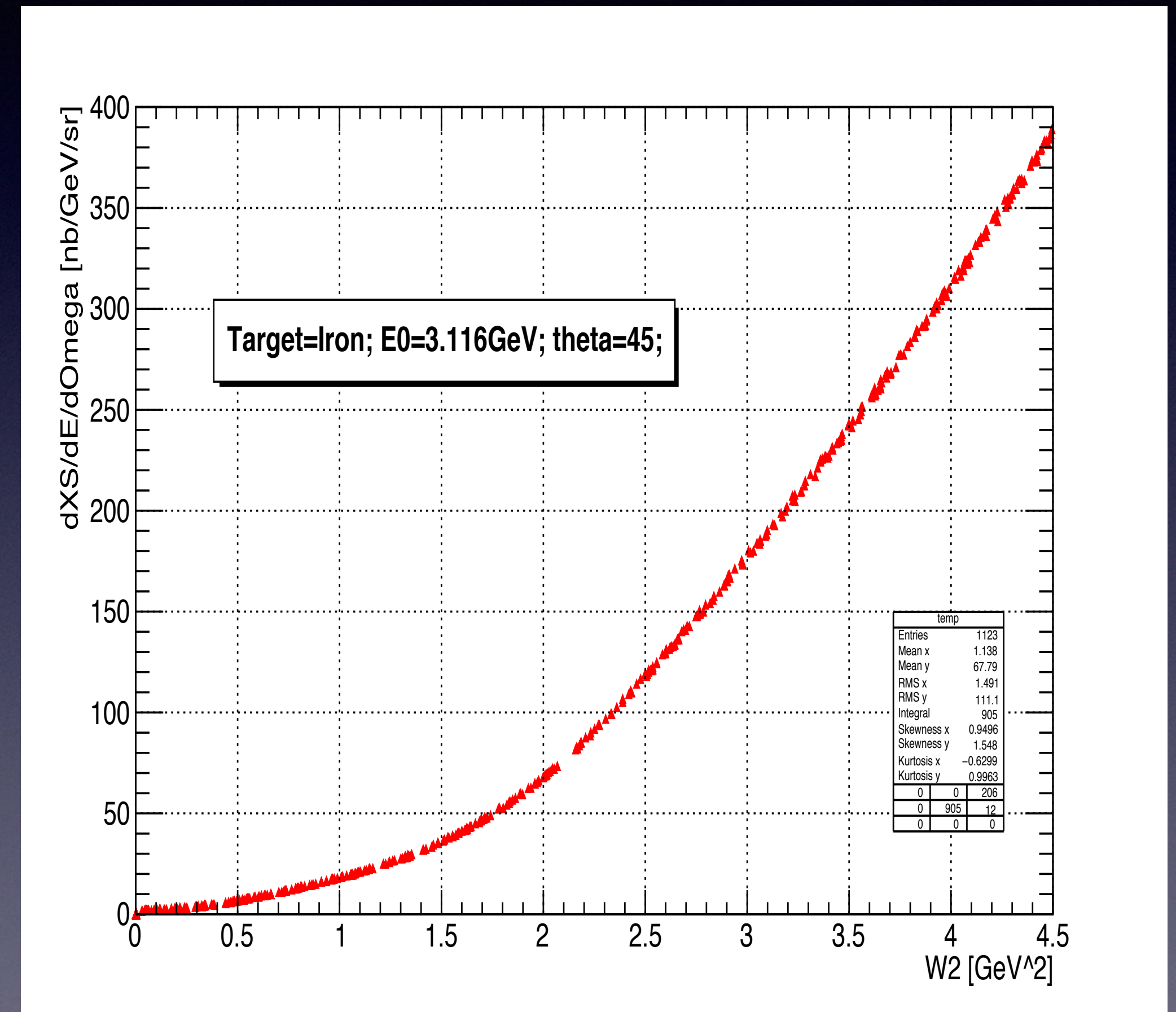


Simulation from software with PB

Iron Target

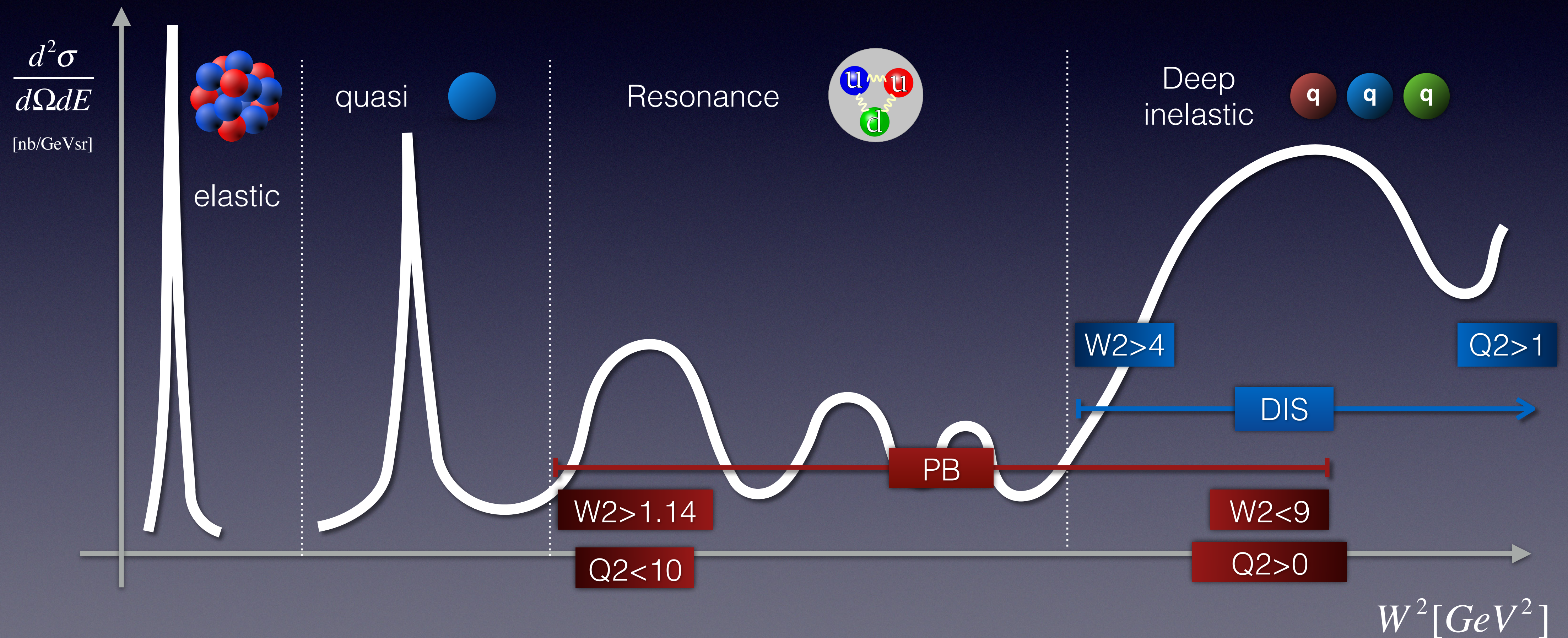


Data (JLab E06-109)



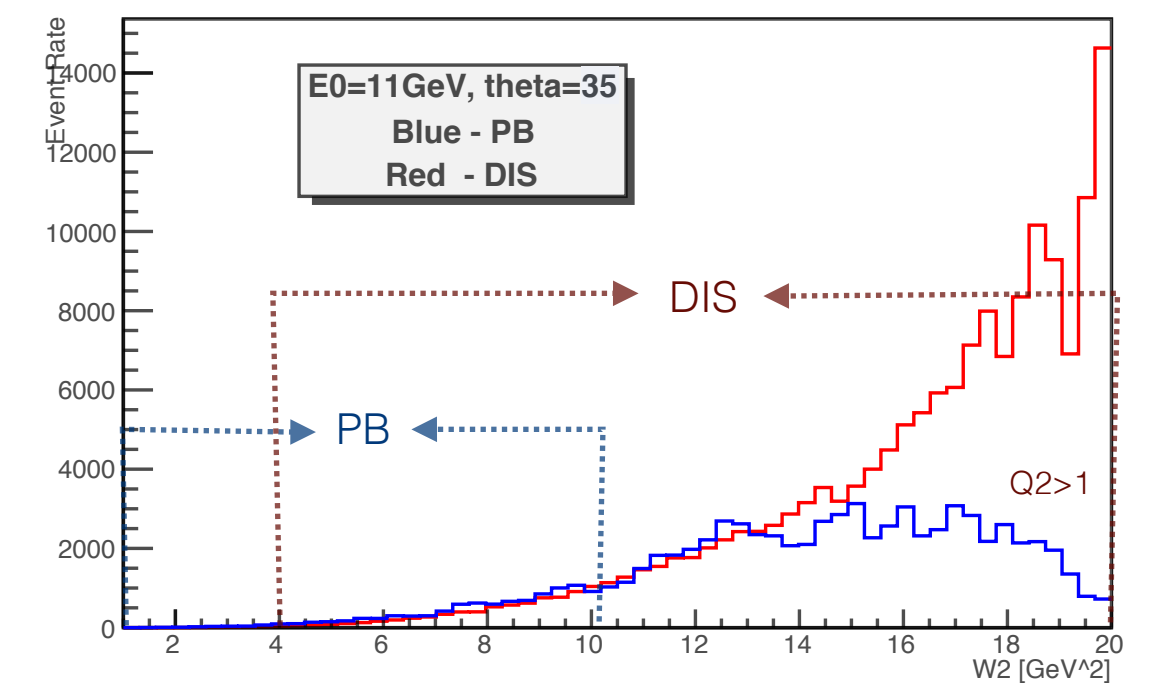
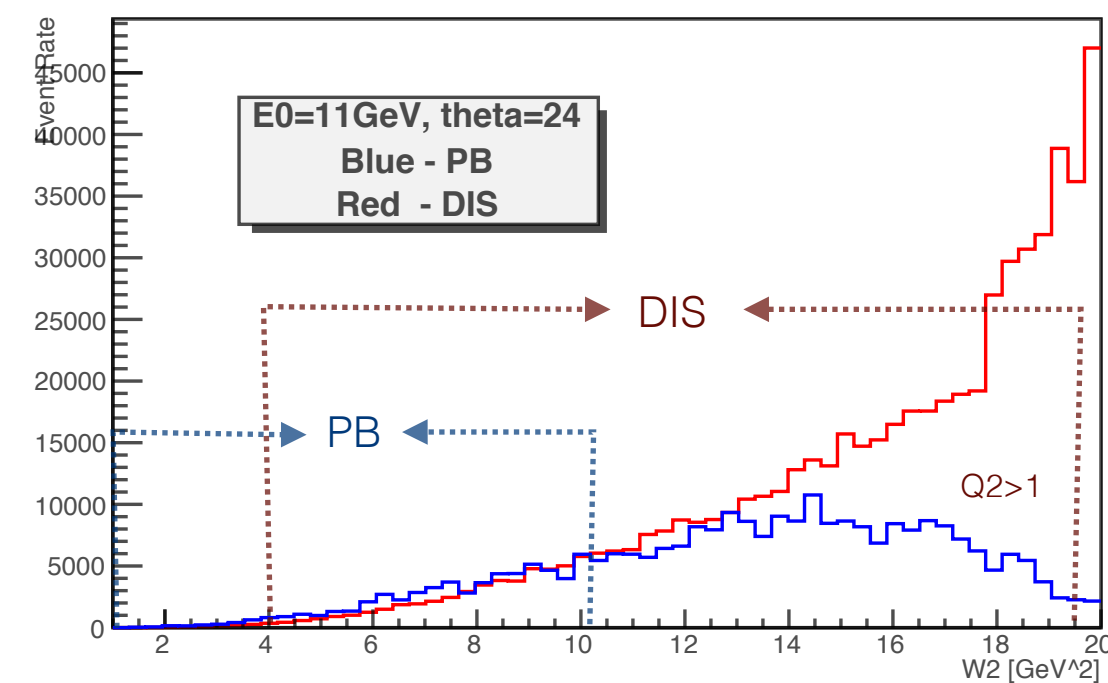
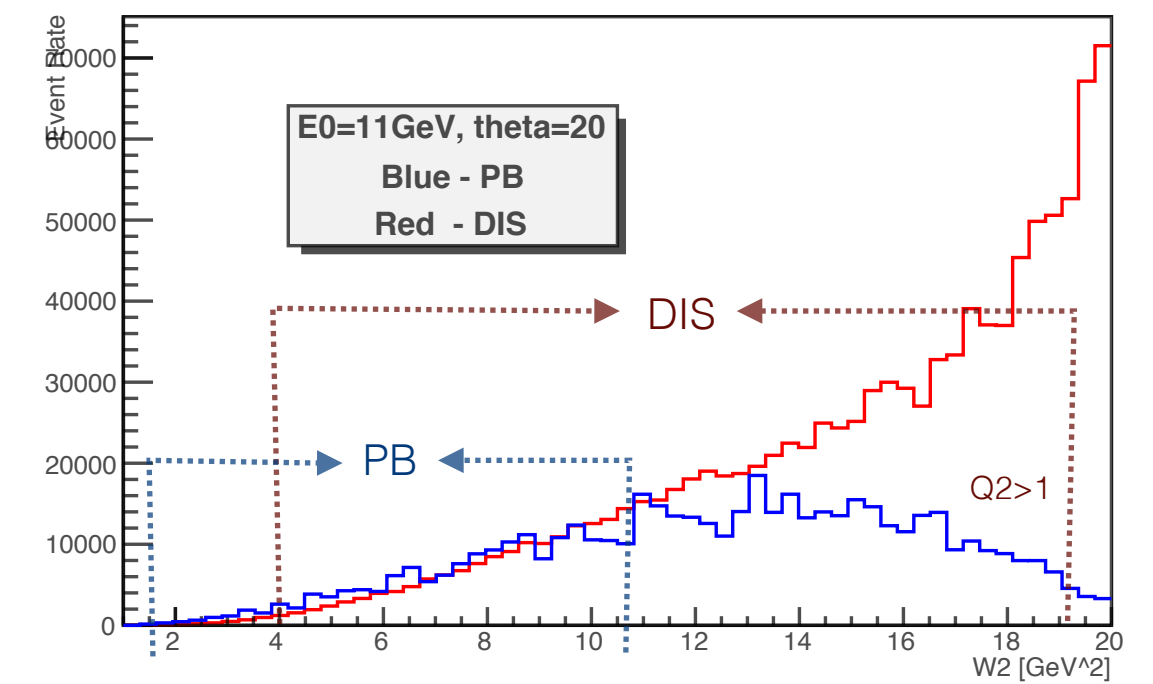
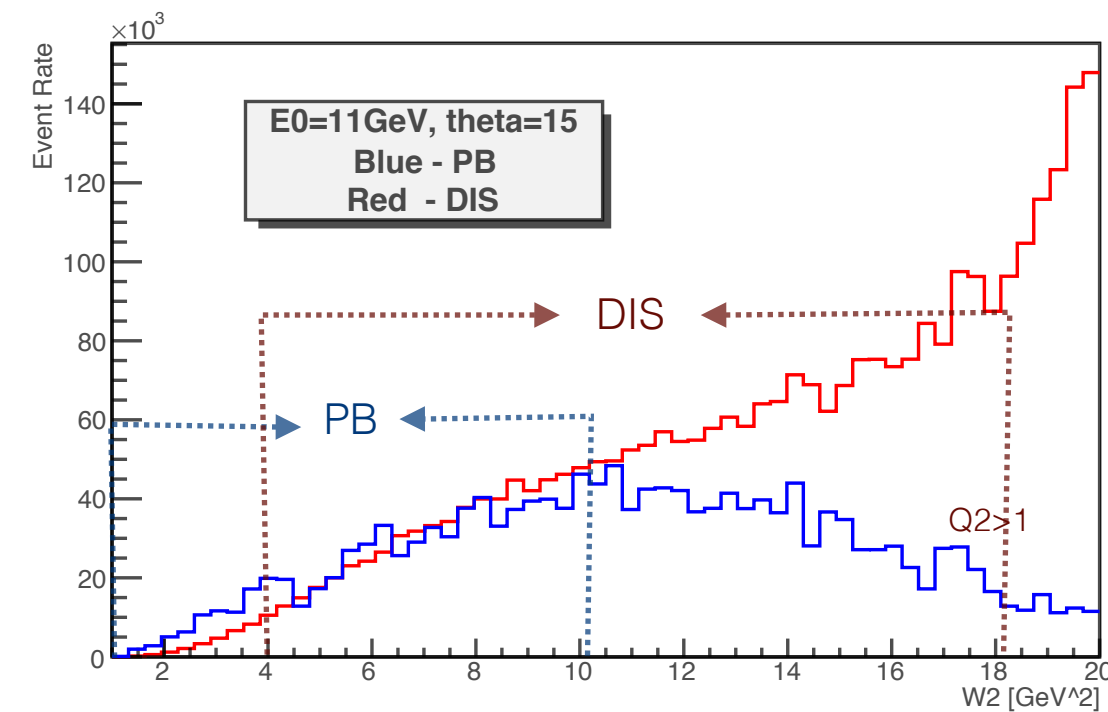
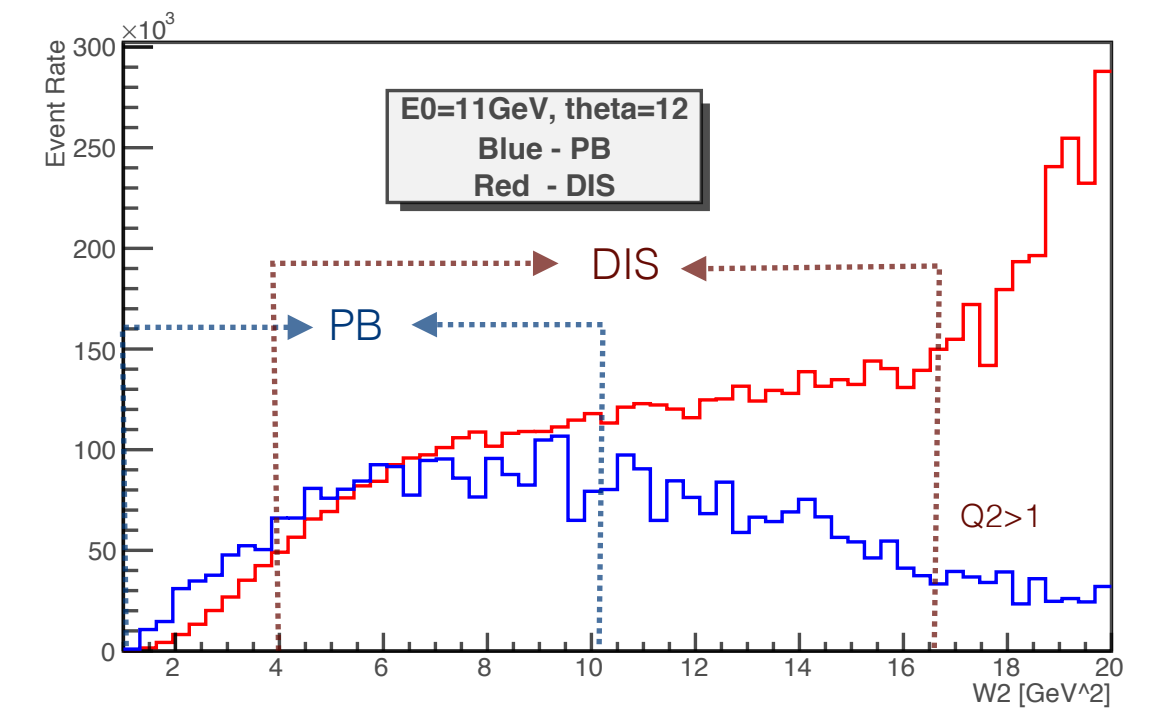
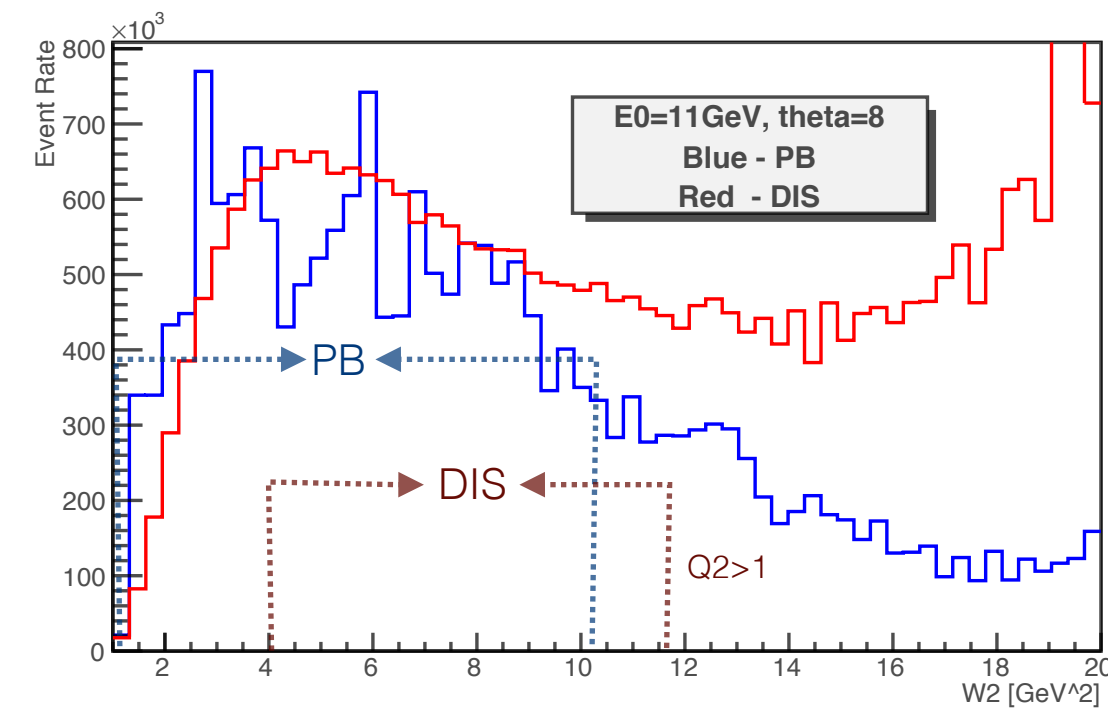
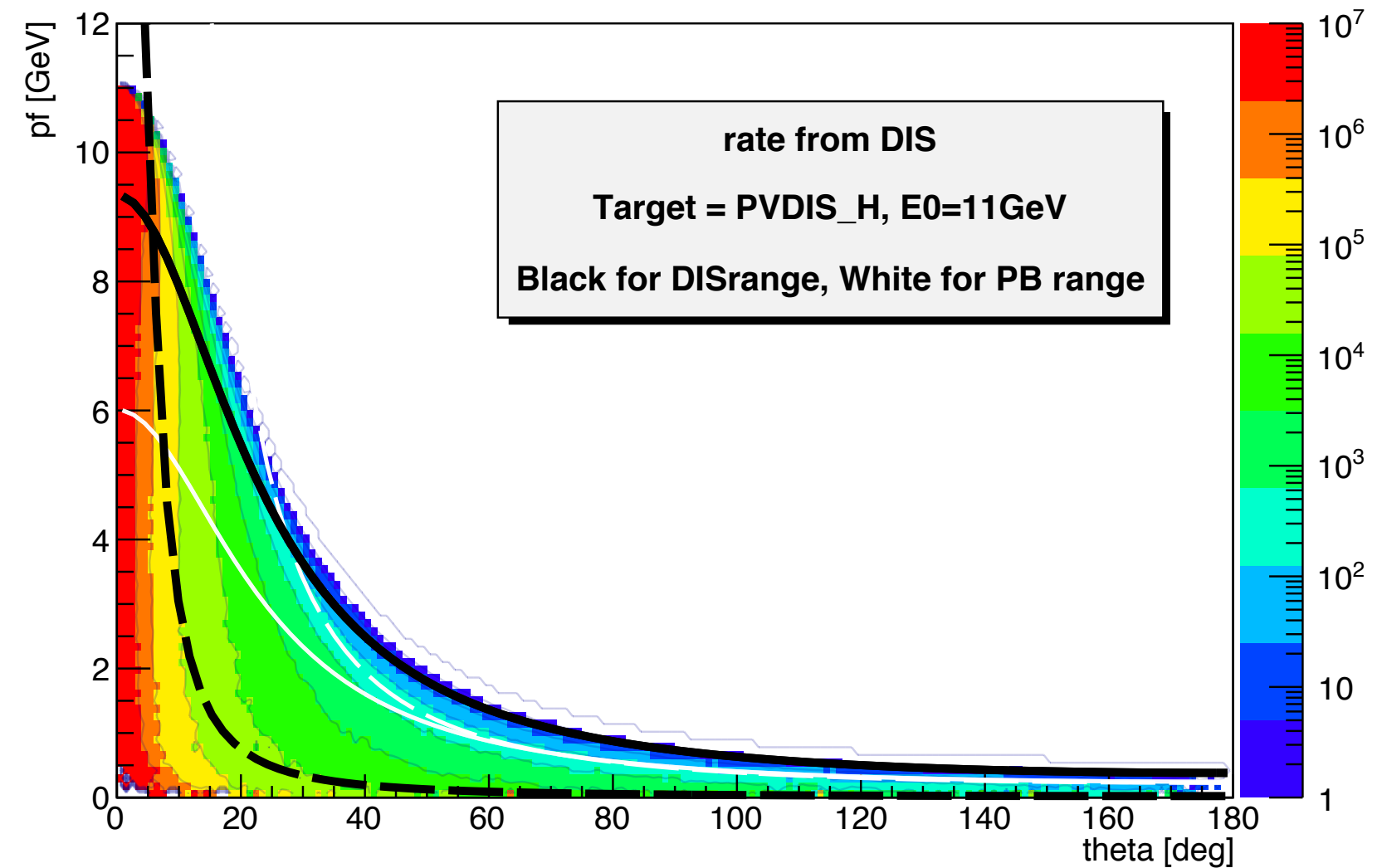
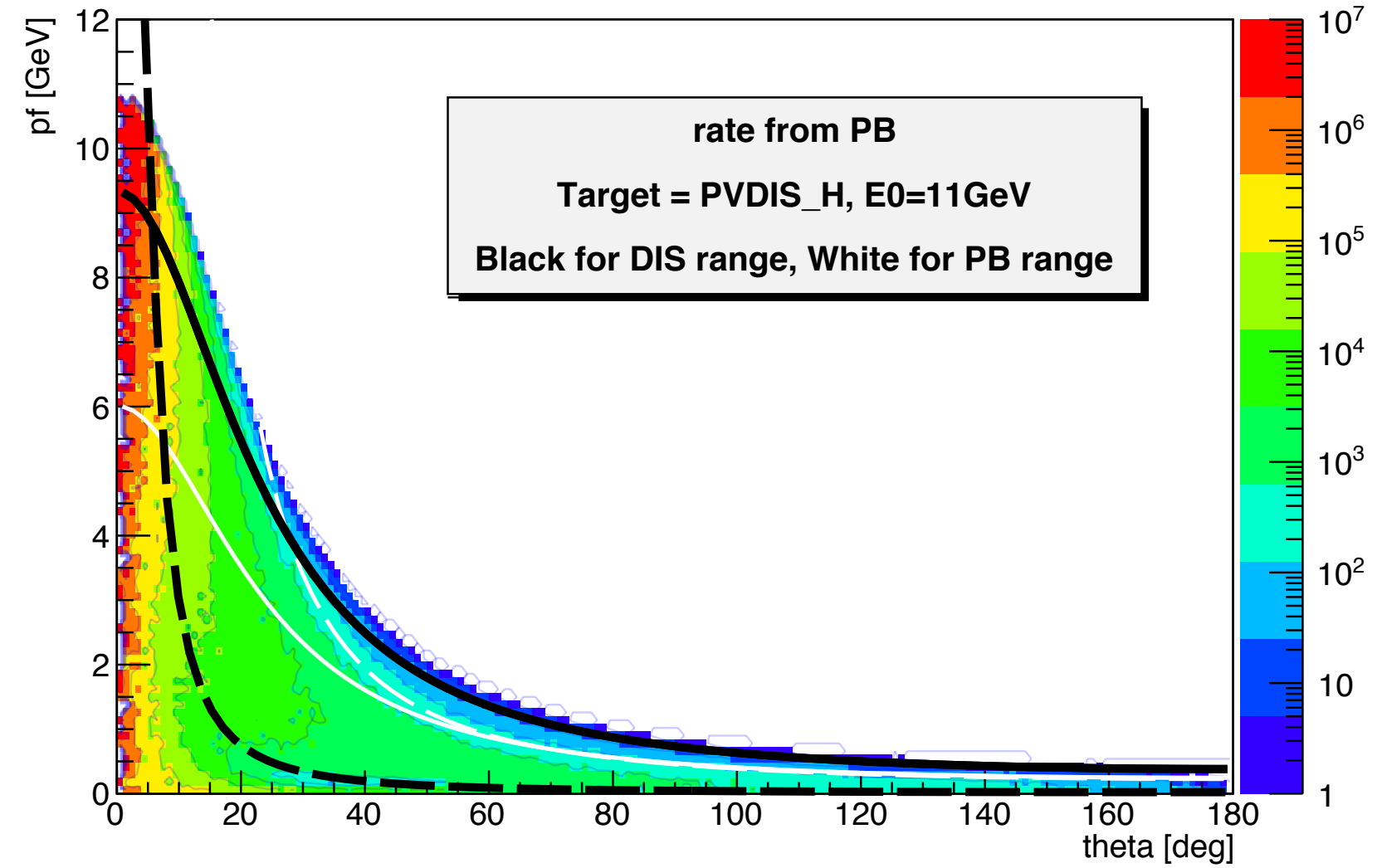
Simulation from software with PB

DIS vs PB

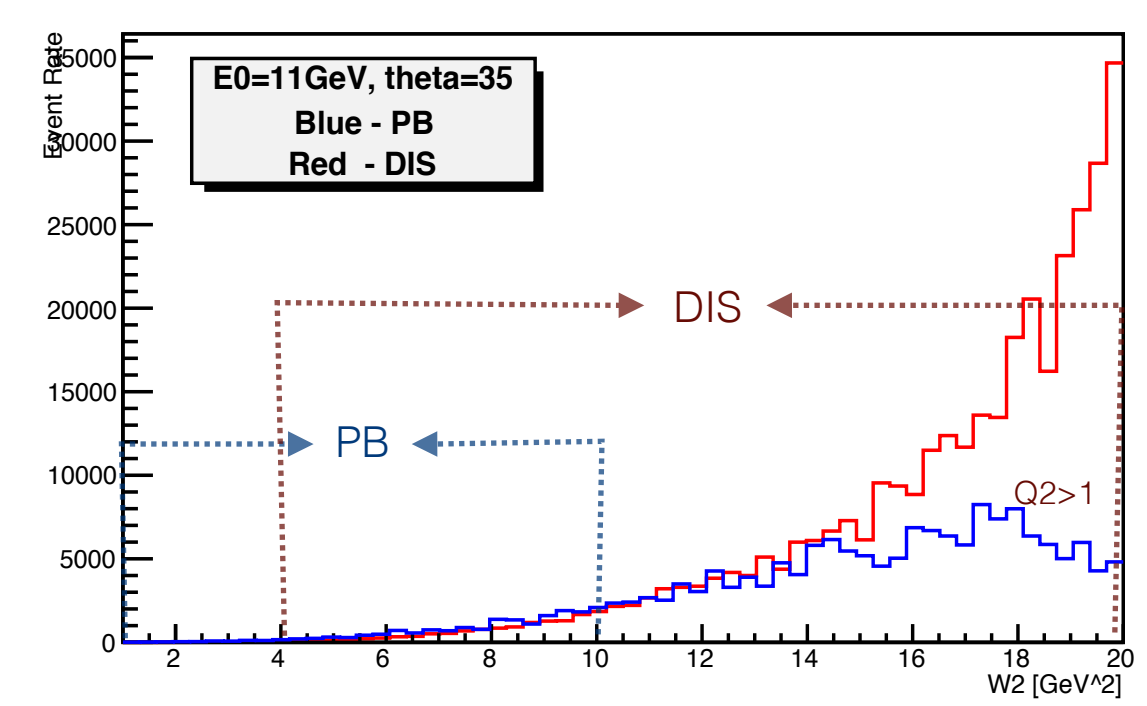
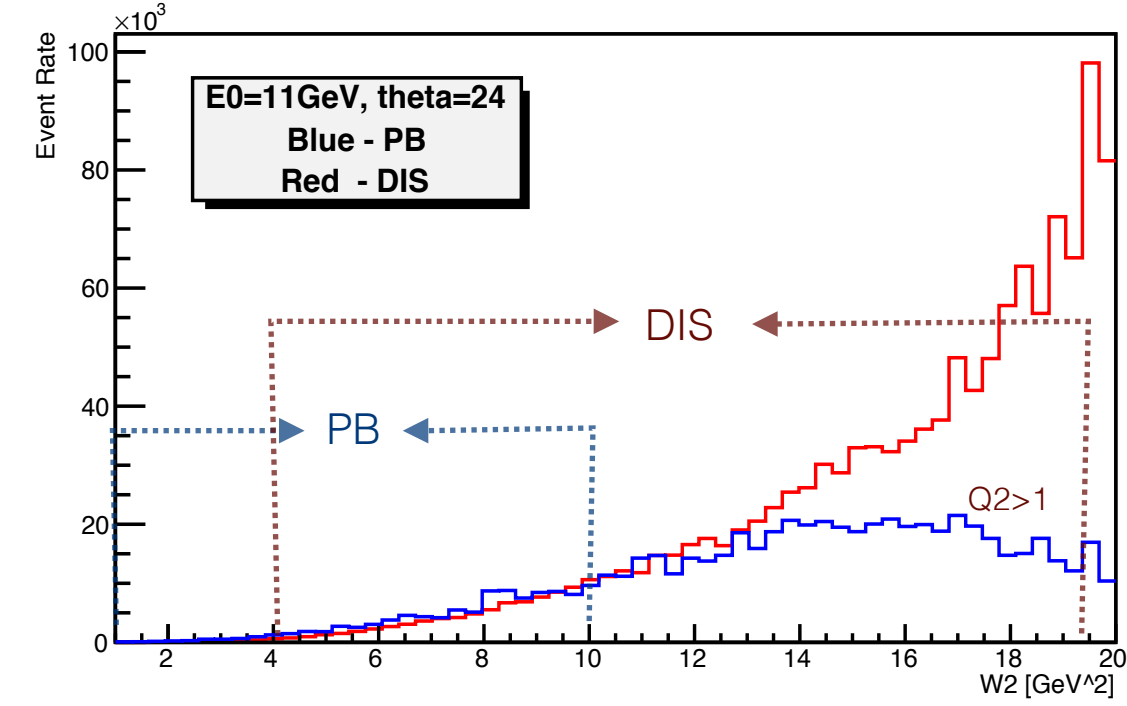
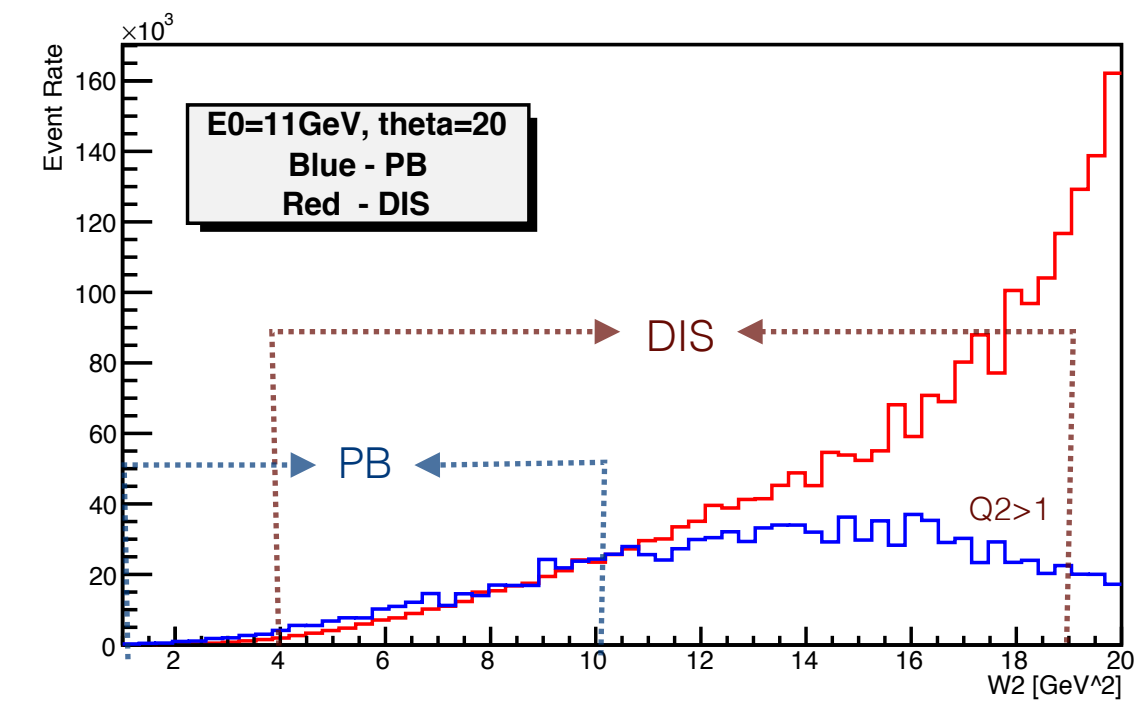
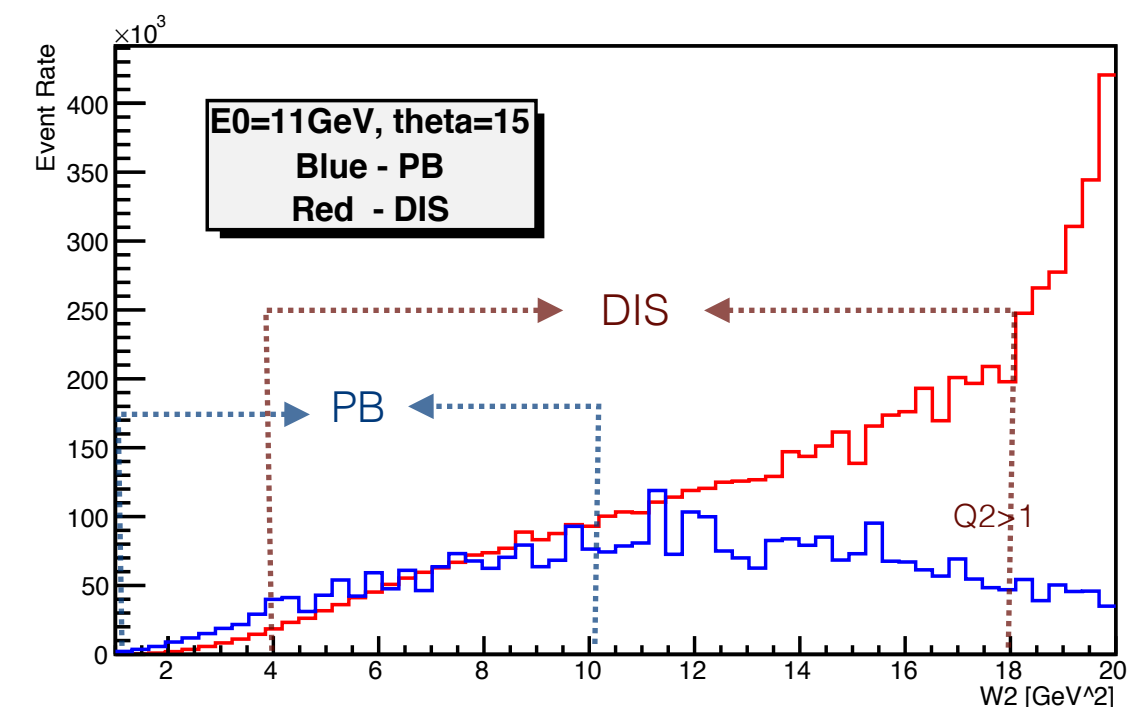
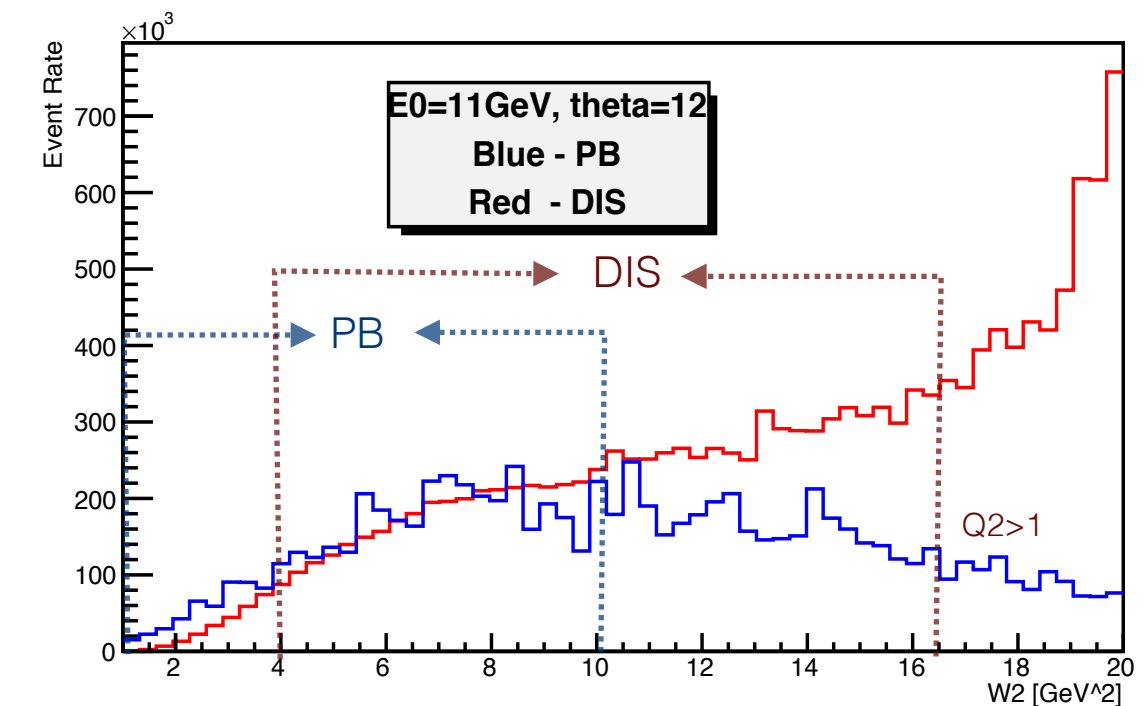
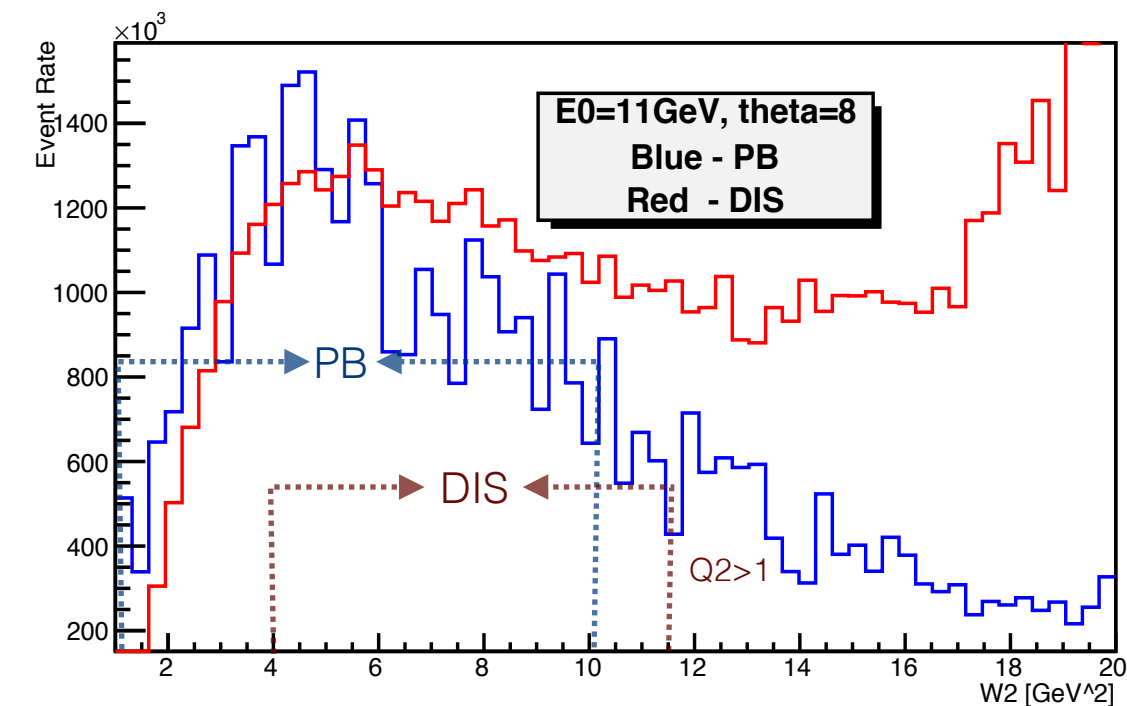
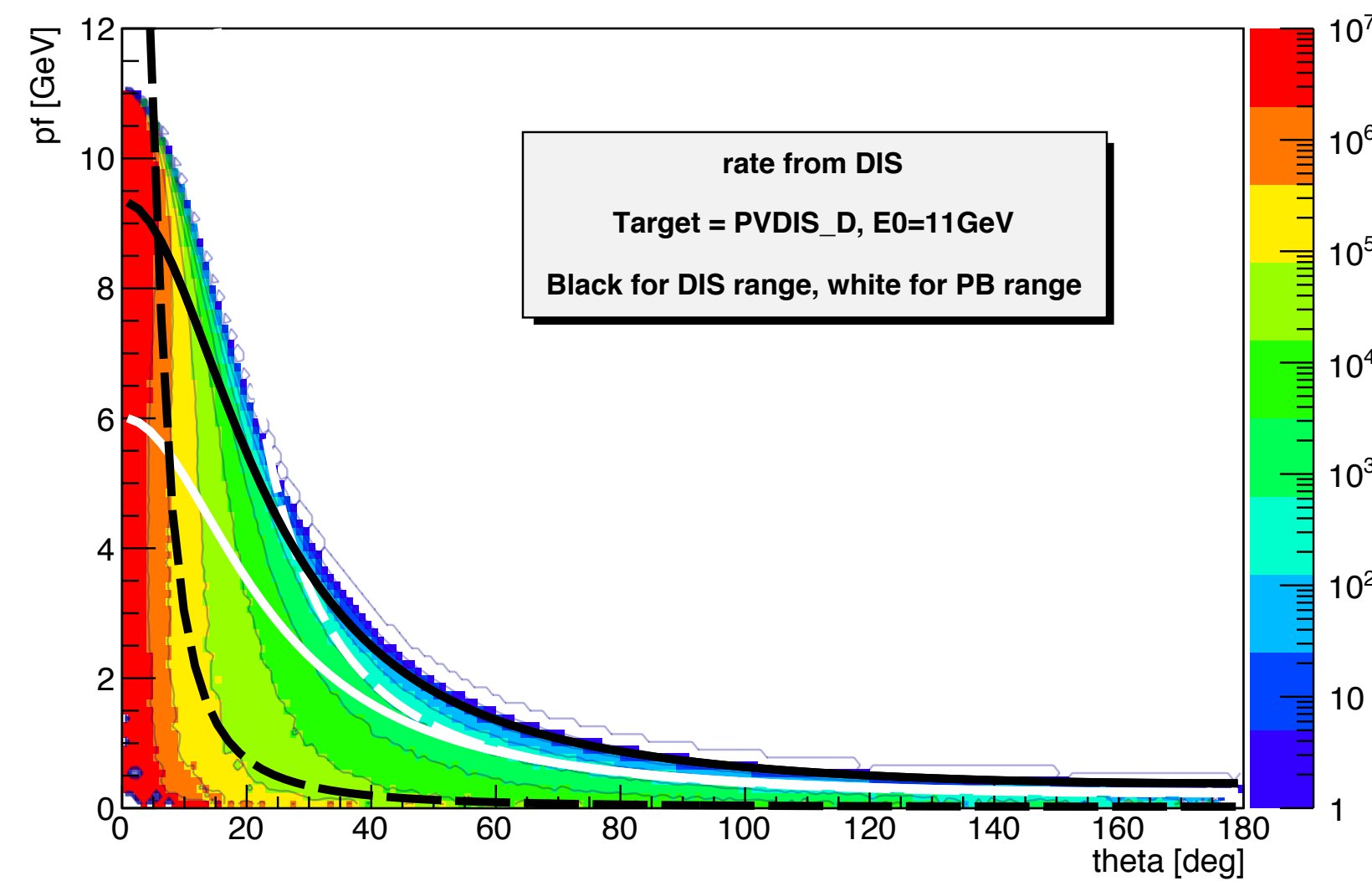
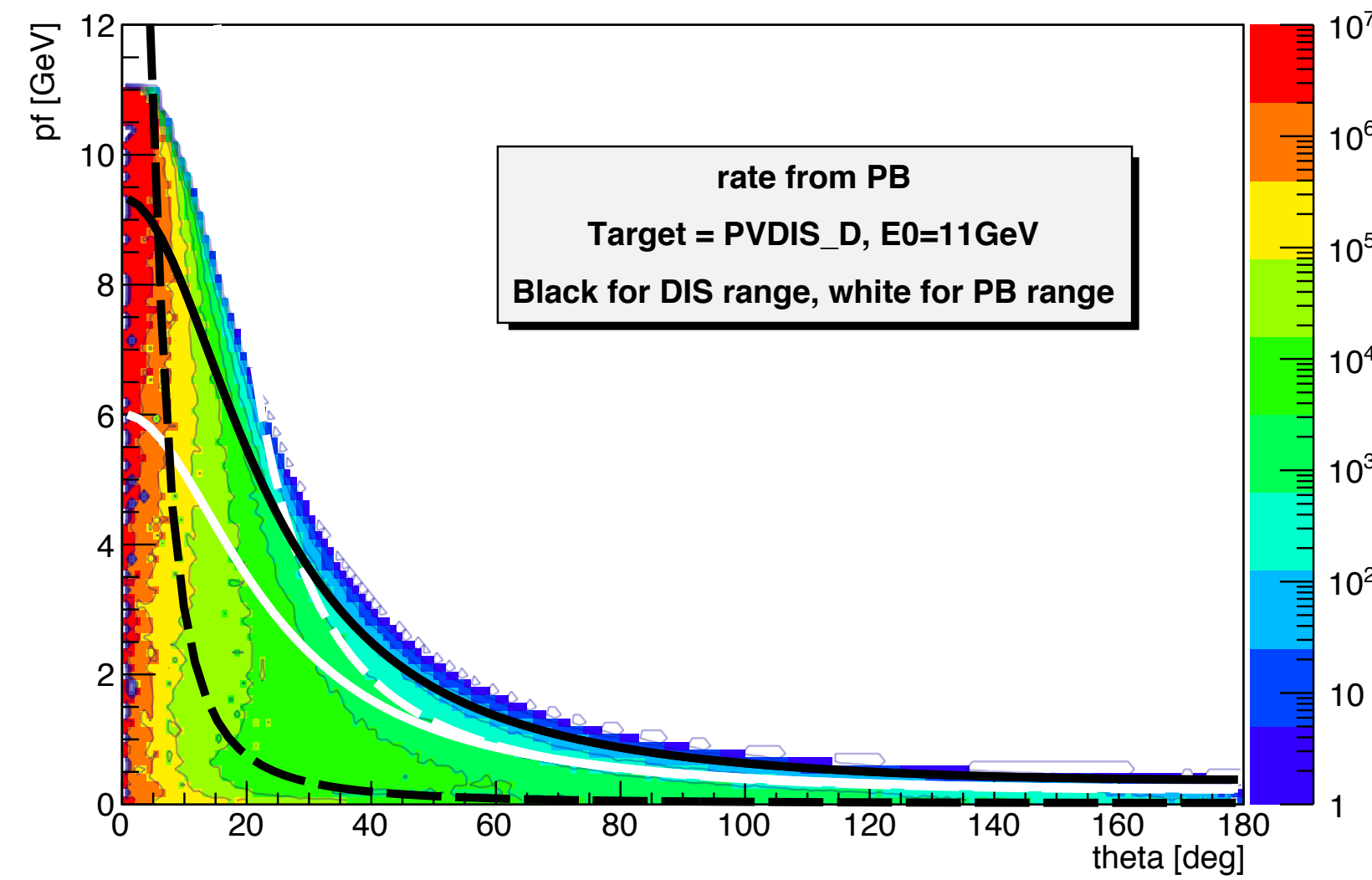


PVDIS LH2		PB	PVDIS H: rate from PB	PVDIS H: rate from DIS	rate_PB/rate_DIS
PVDIS LD2		PB	PVDIS D: rate from PB	PVDIS D: rate from DIS	rate_PB/rate_DIS
JPsi LH2		DIS	JPsi H: rate from PB	JPsi H: rate from DIS	rate_PB/rate_DIS
SIDIS He3		DIS	SIDIS He3: rate from PB	SIDIS He3: rate from DIS	rate_PB/rate_DIS

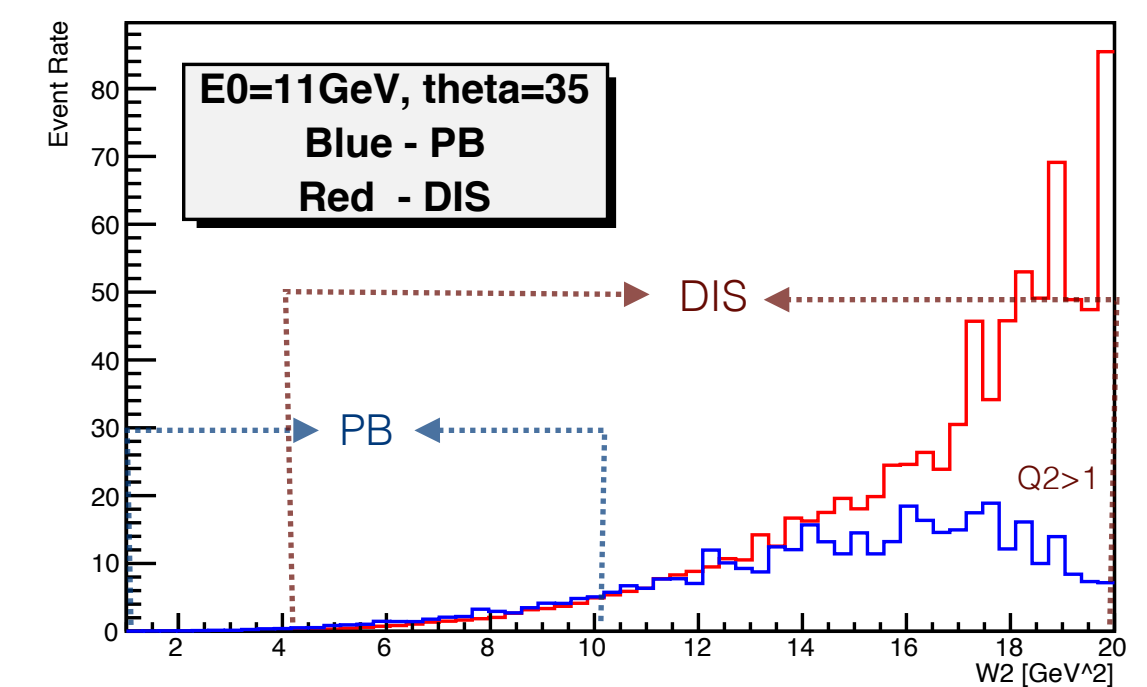
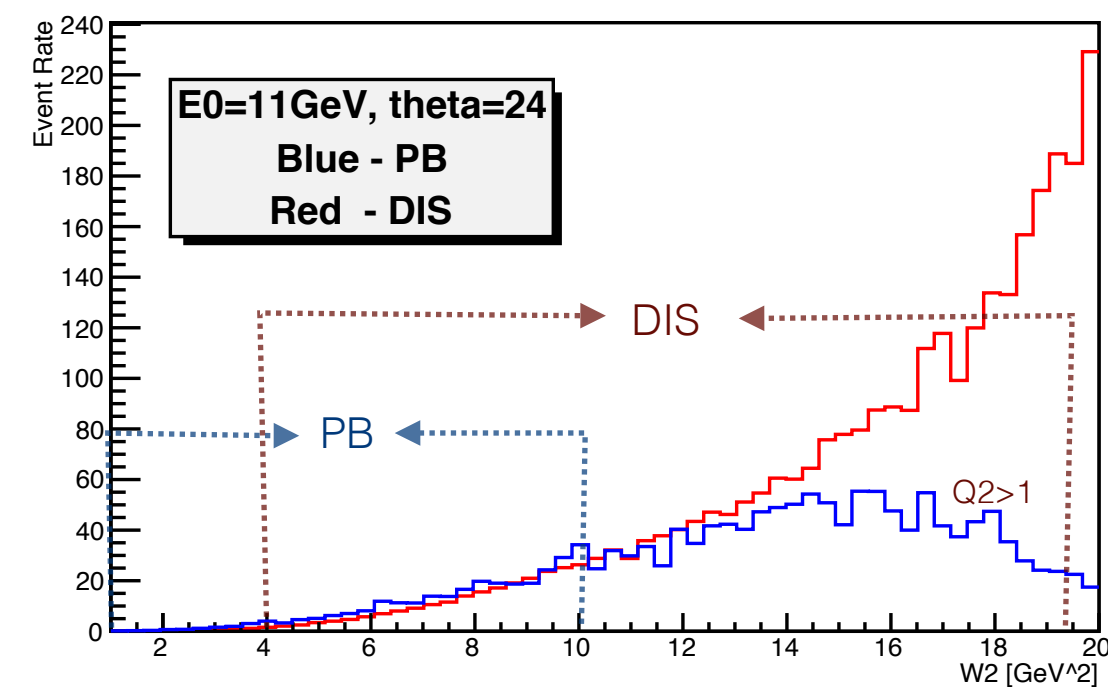
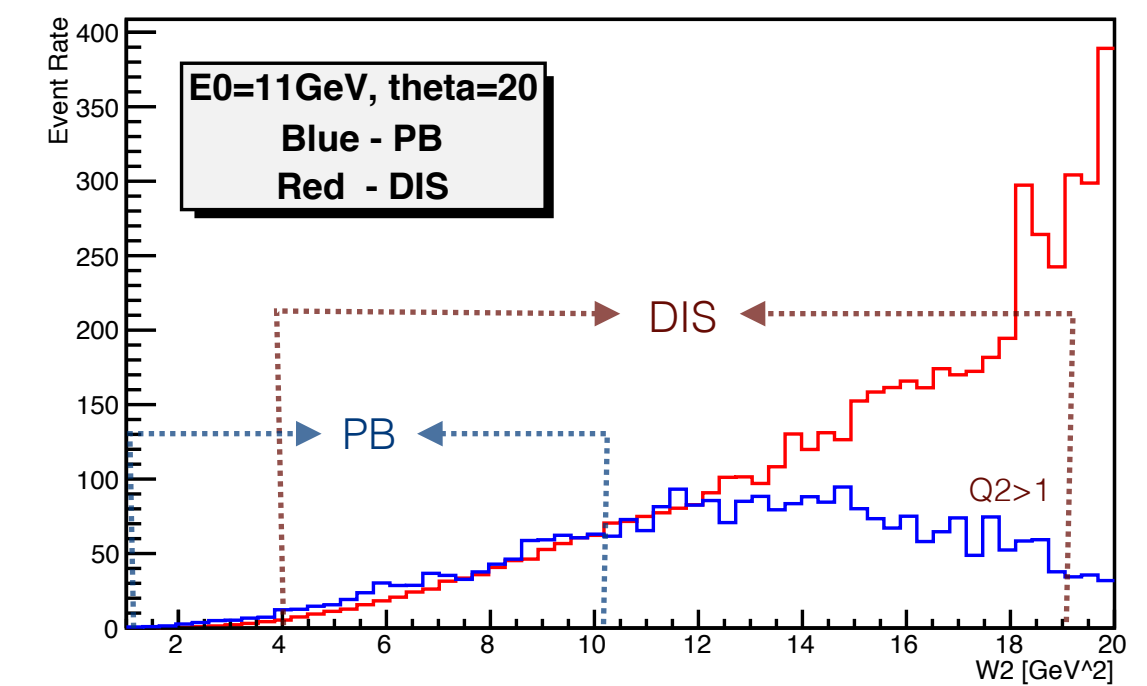
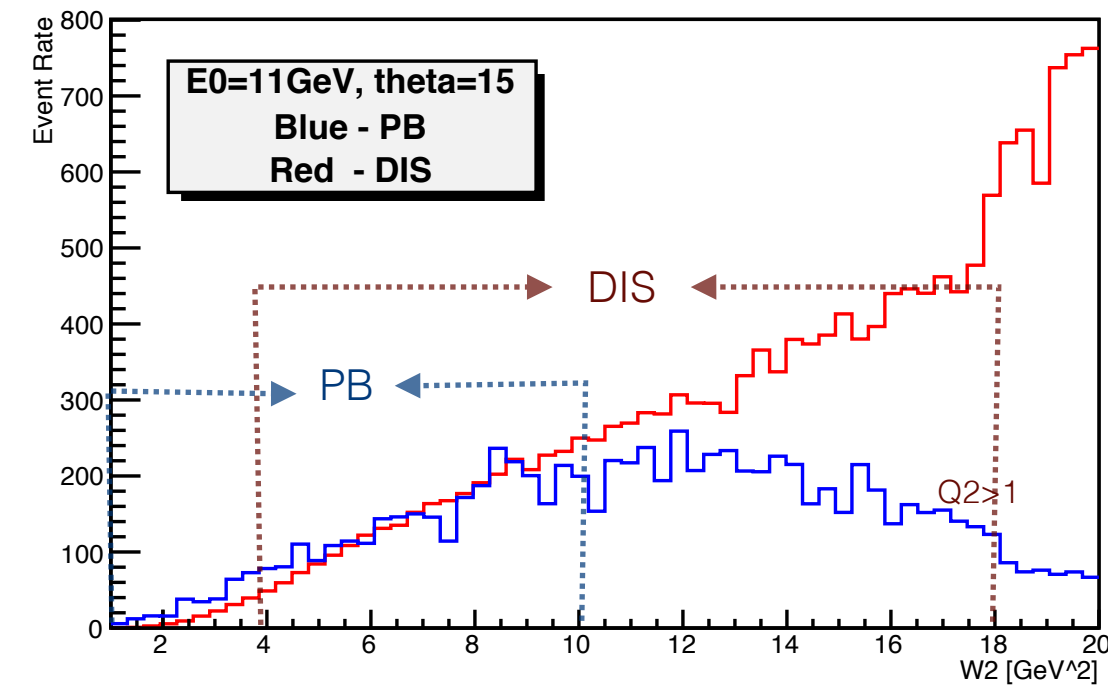
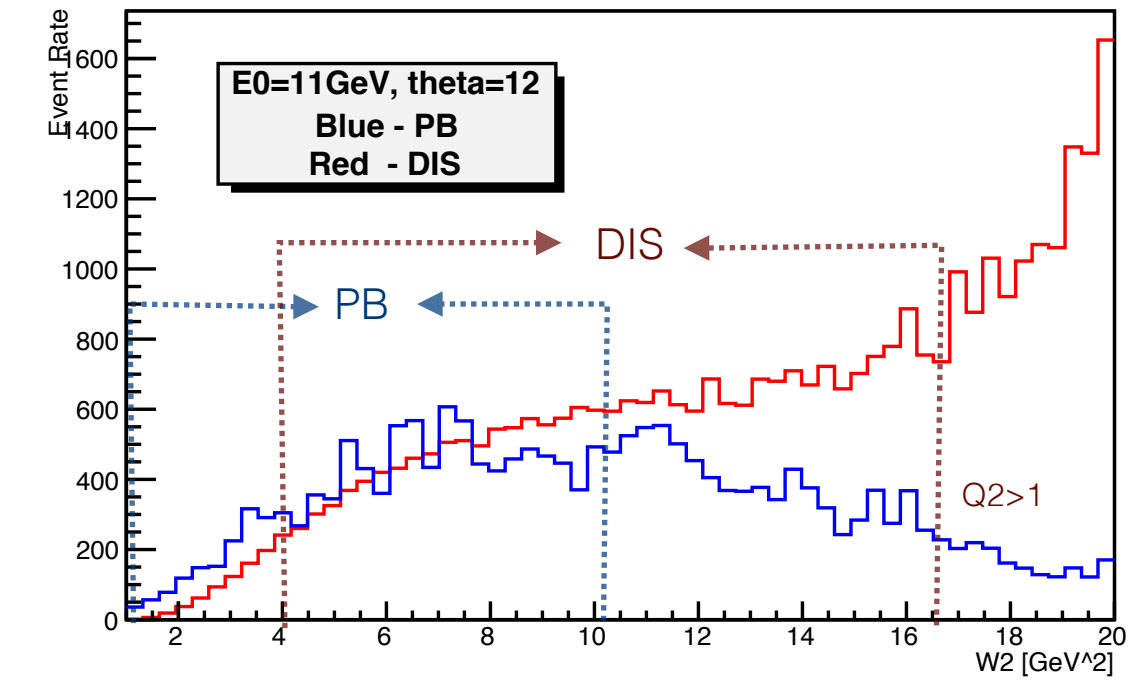
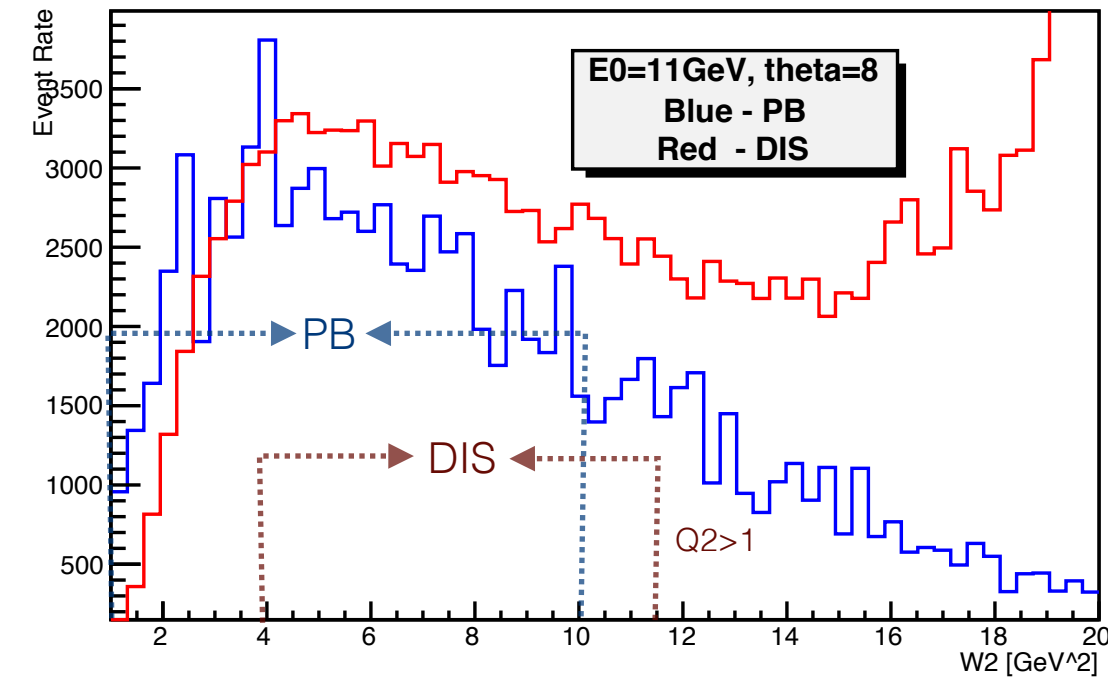
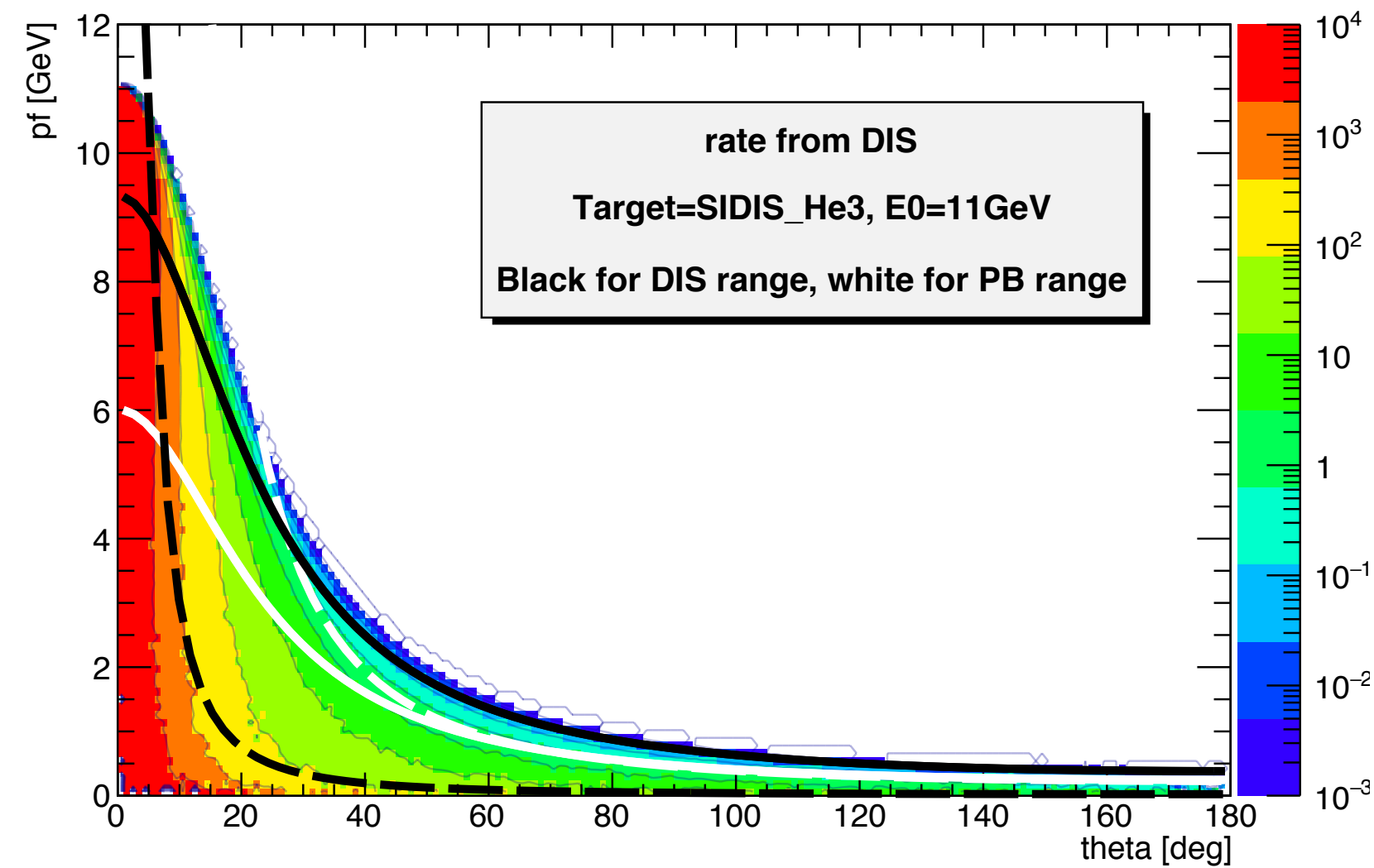
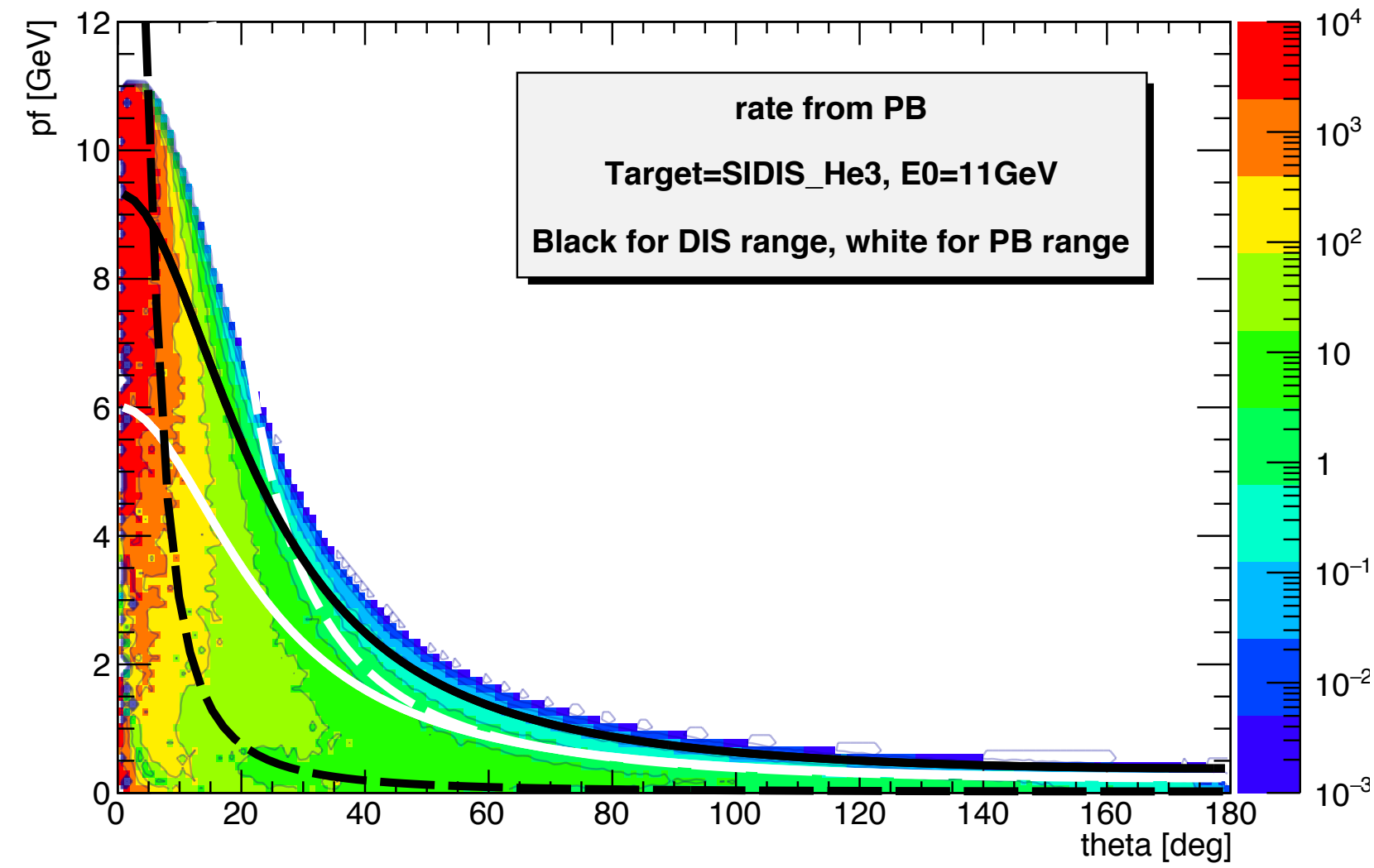
PVDIS H2 target at E0=11GeV



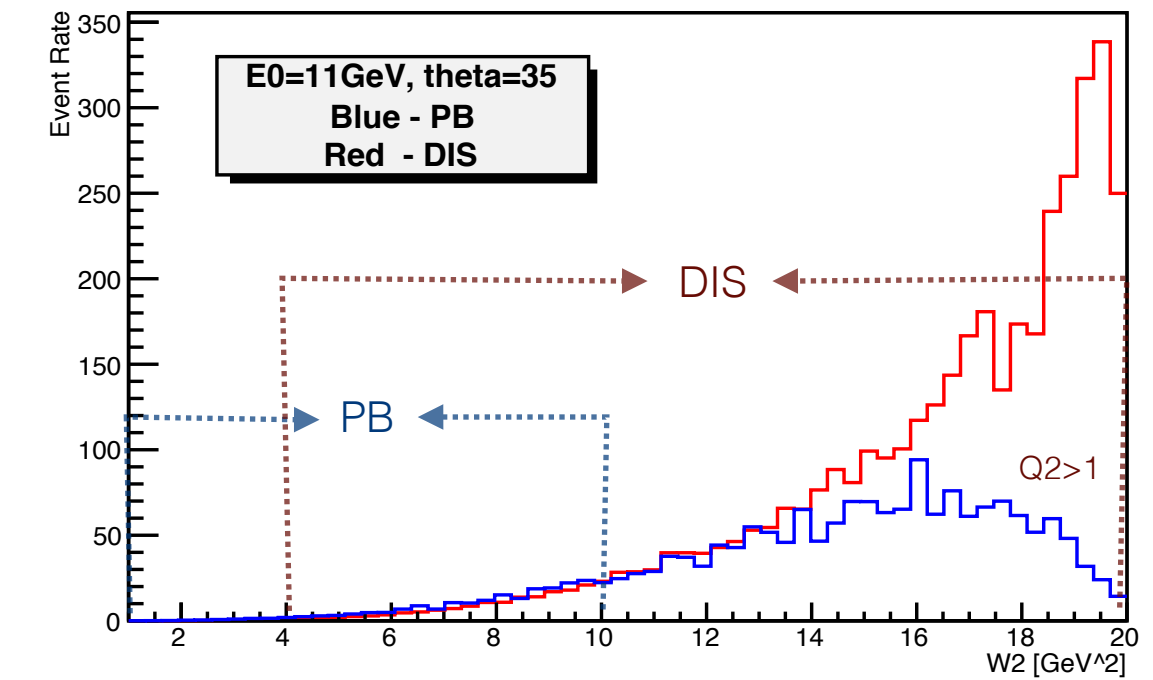
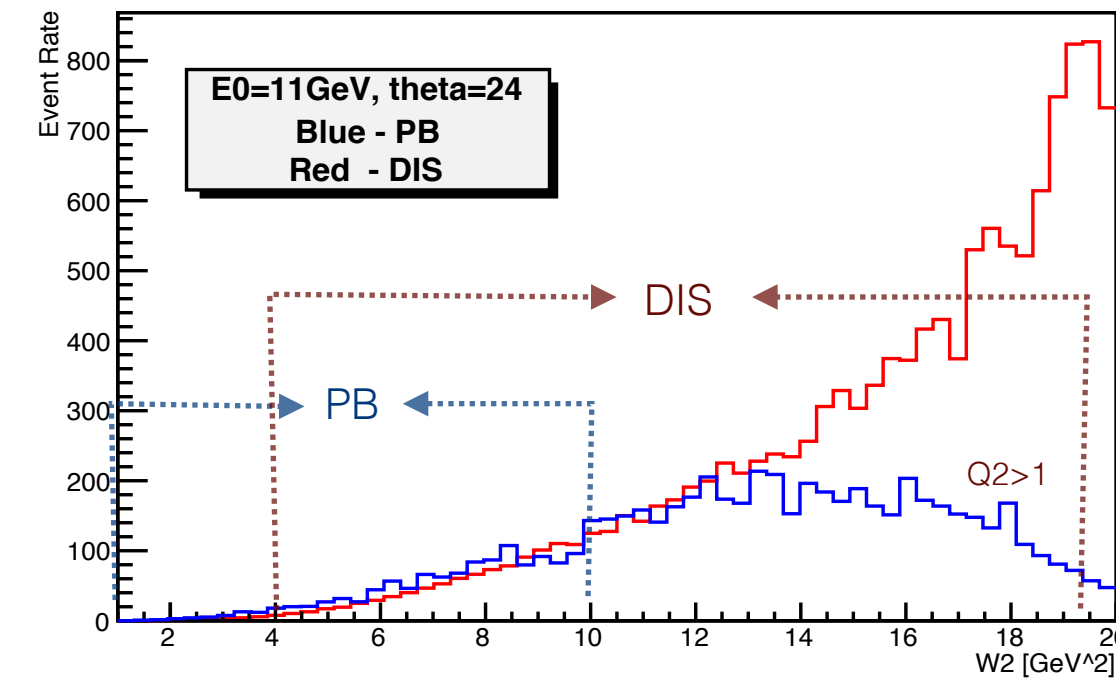
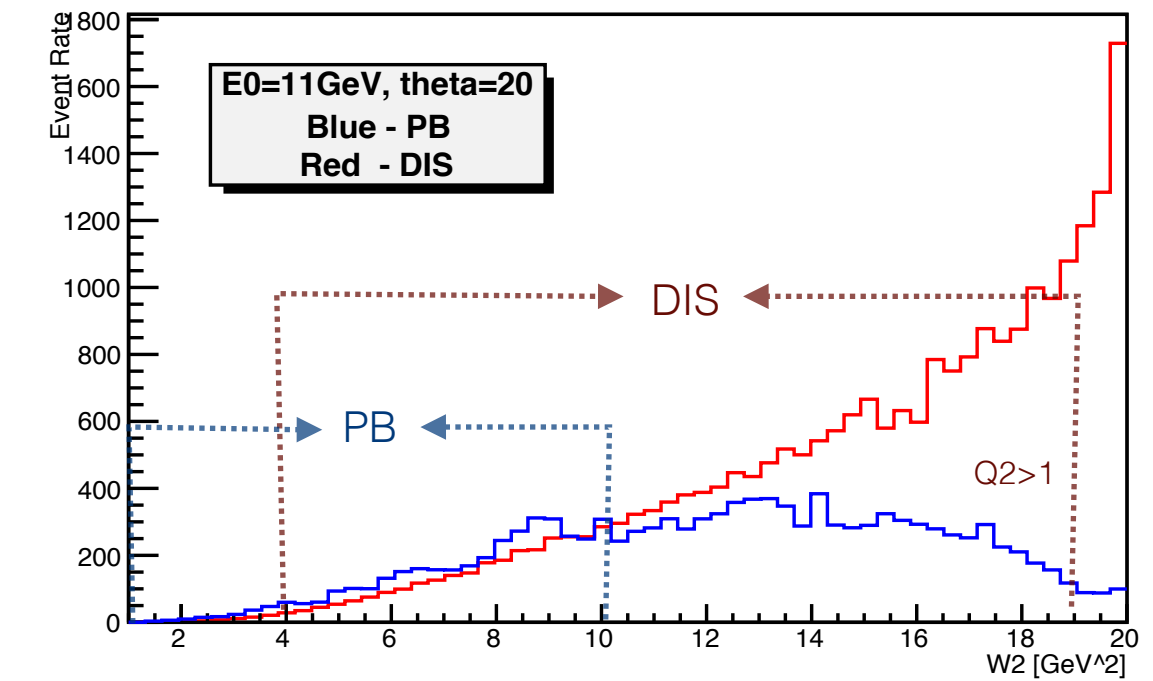
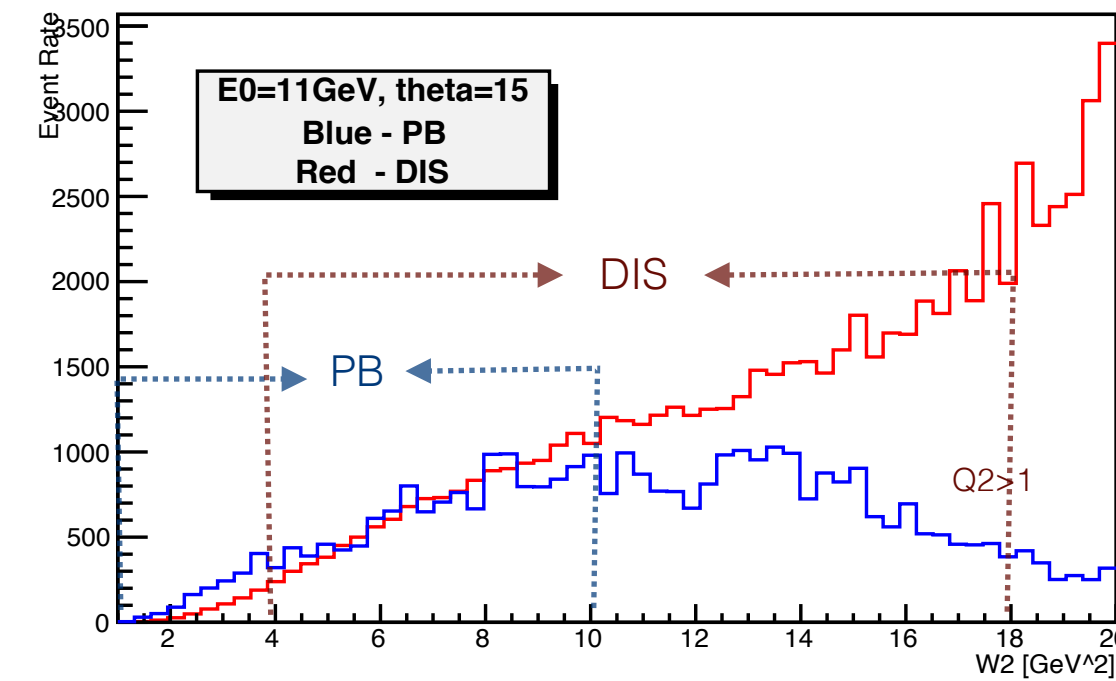
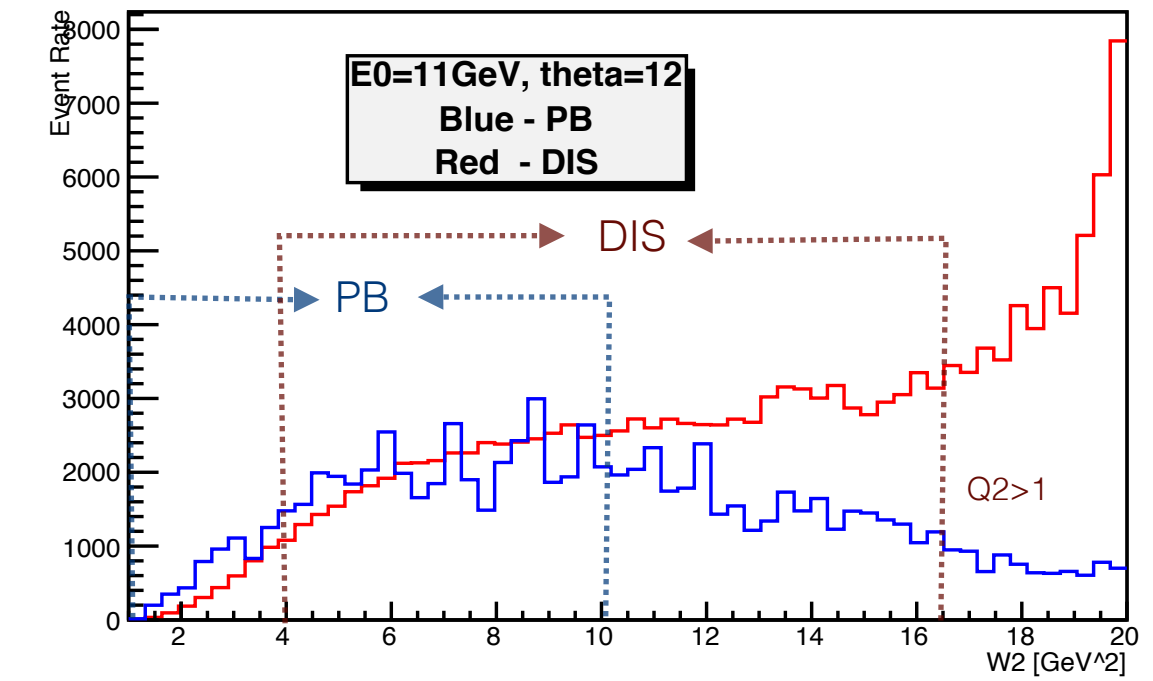
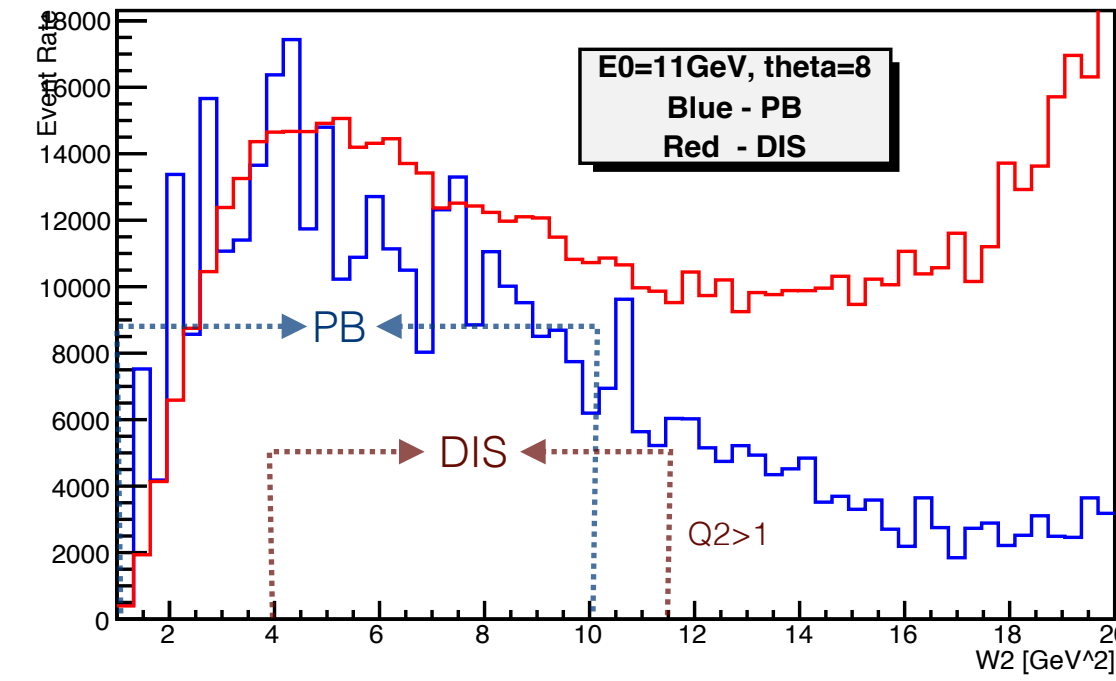
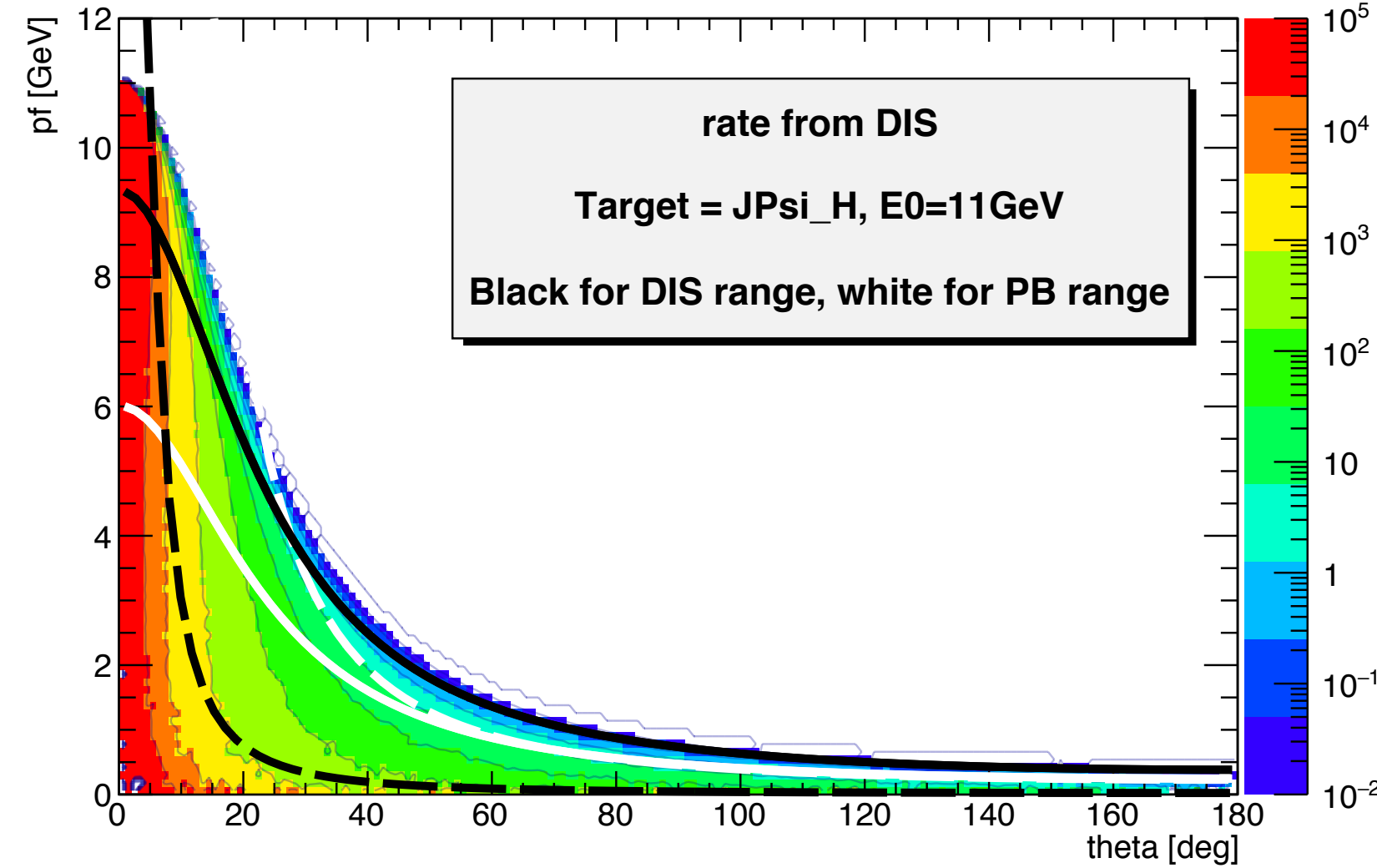
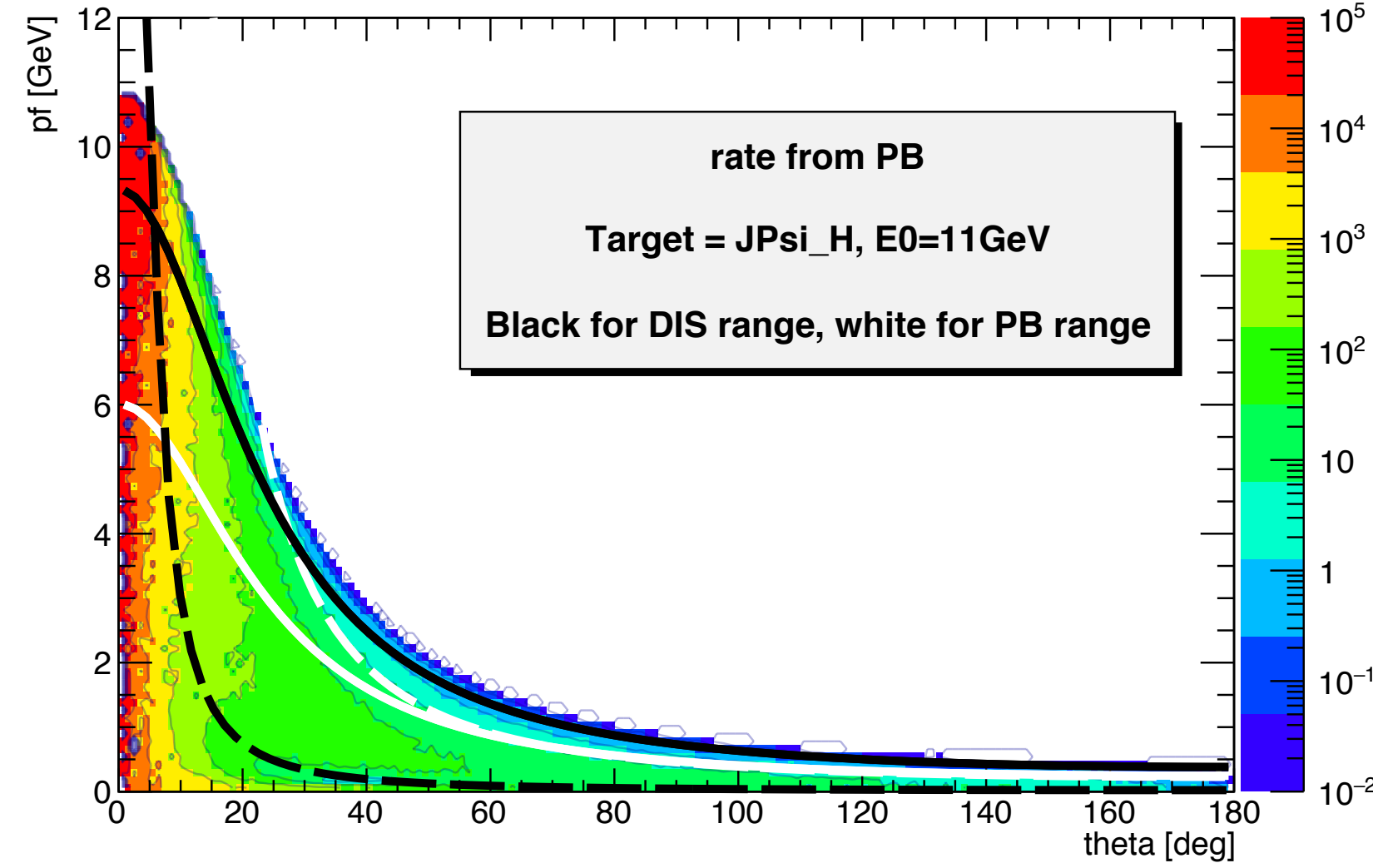
PVDIS D2 target at E0=11GeV



SIDIS He3 target at E0=11GeV

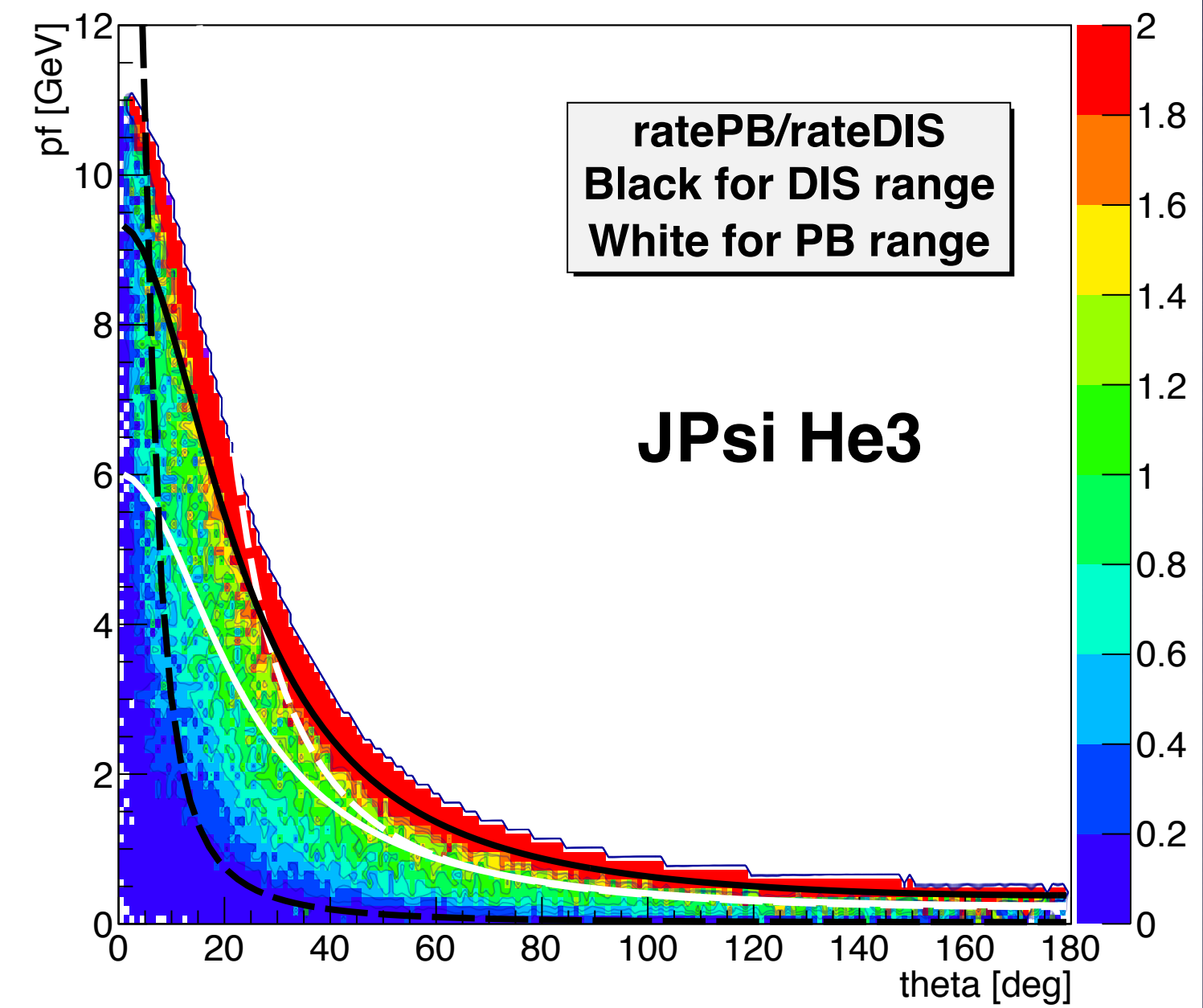
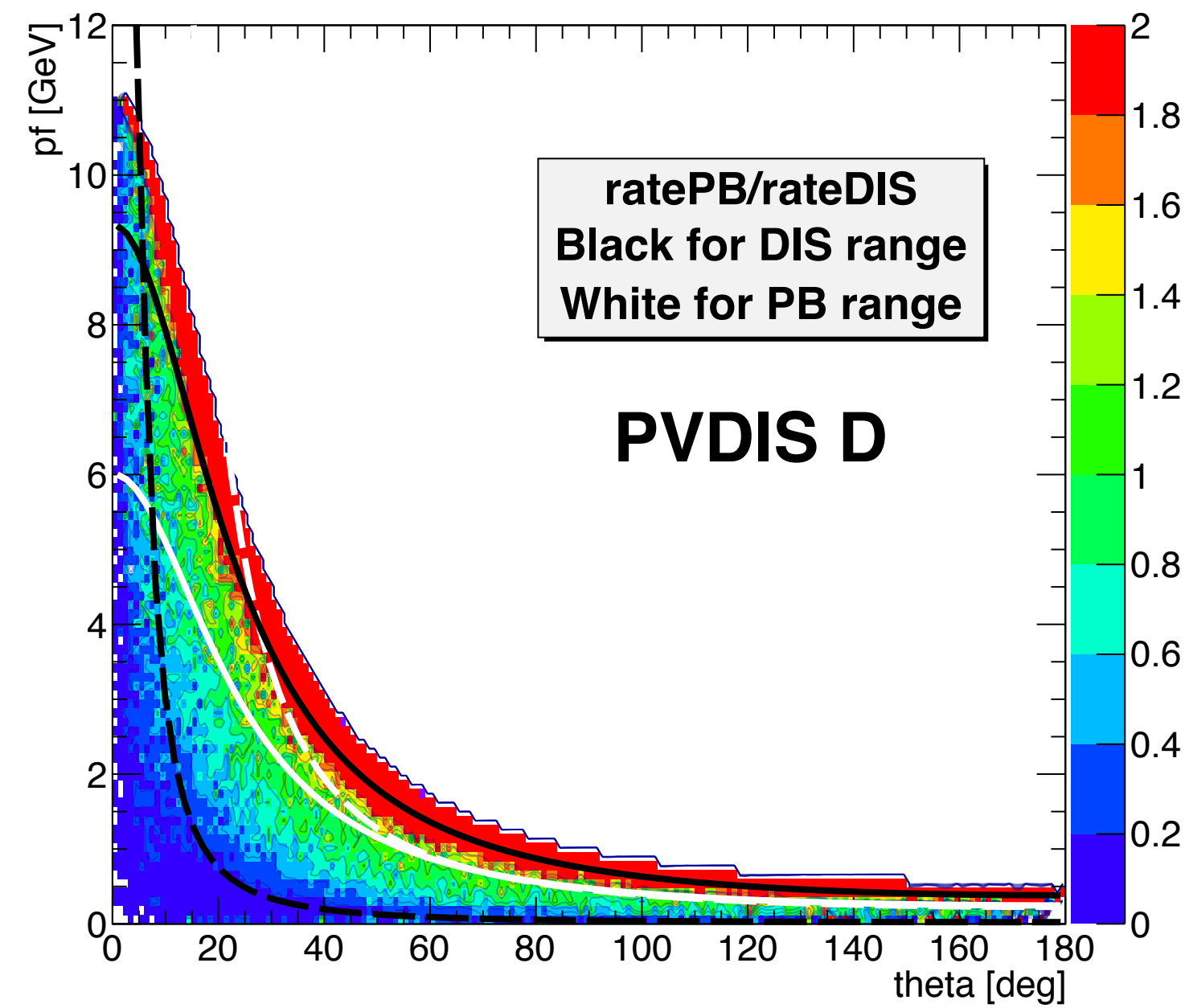
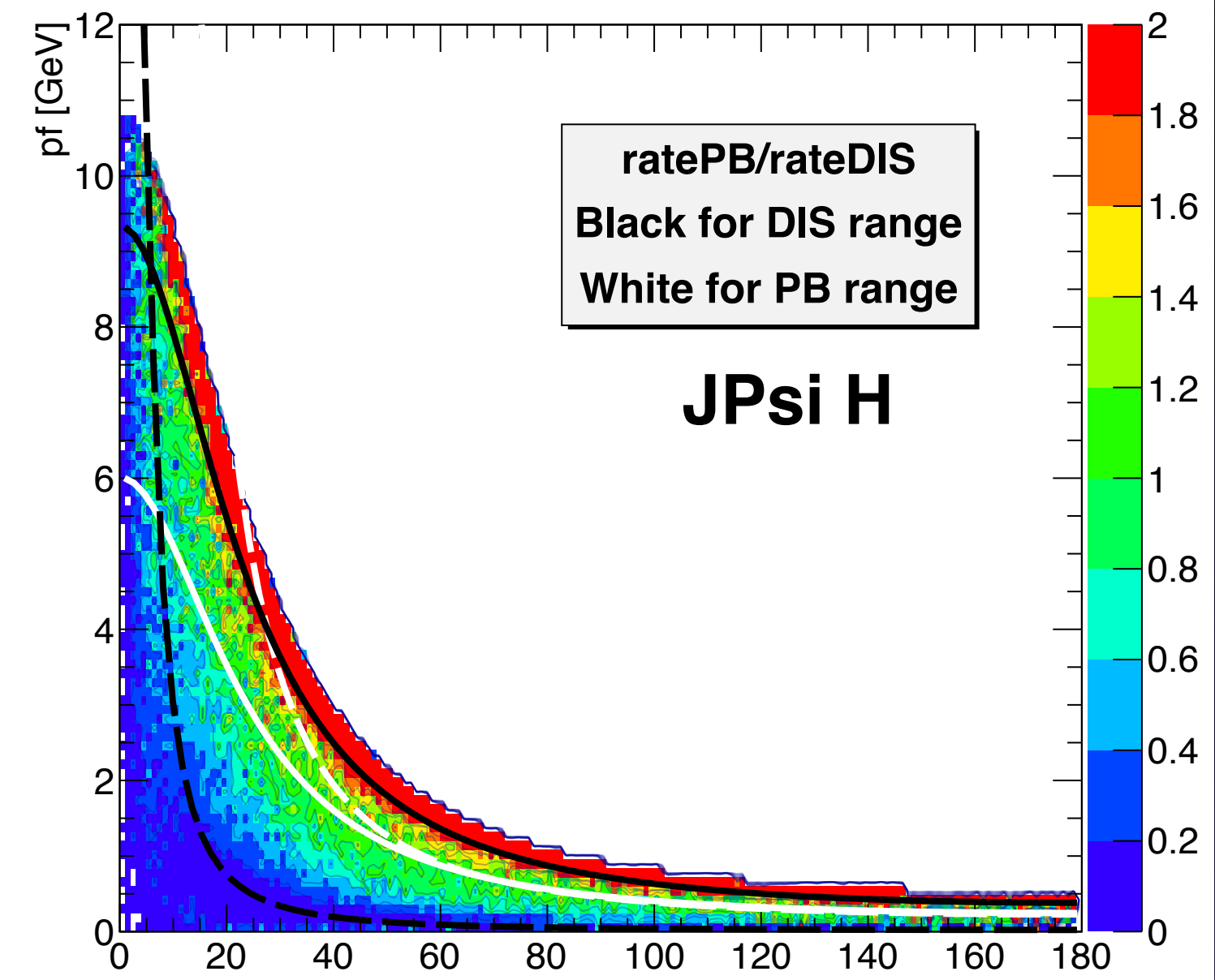
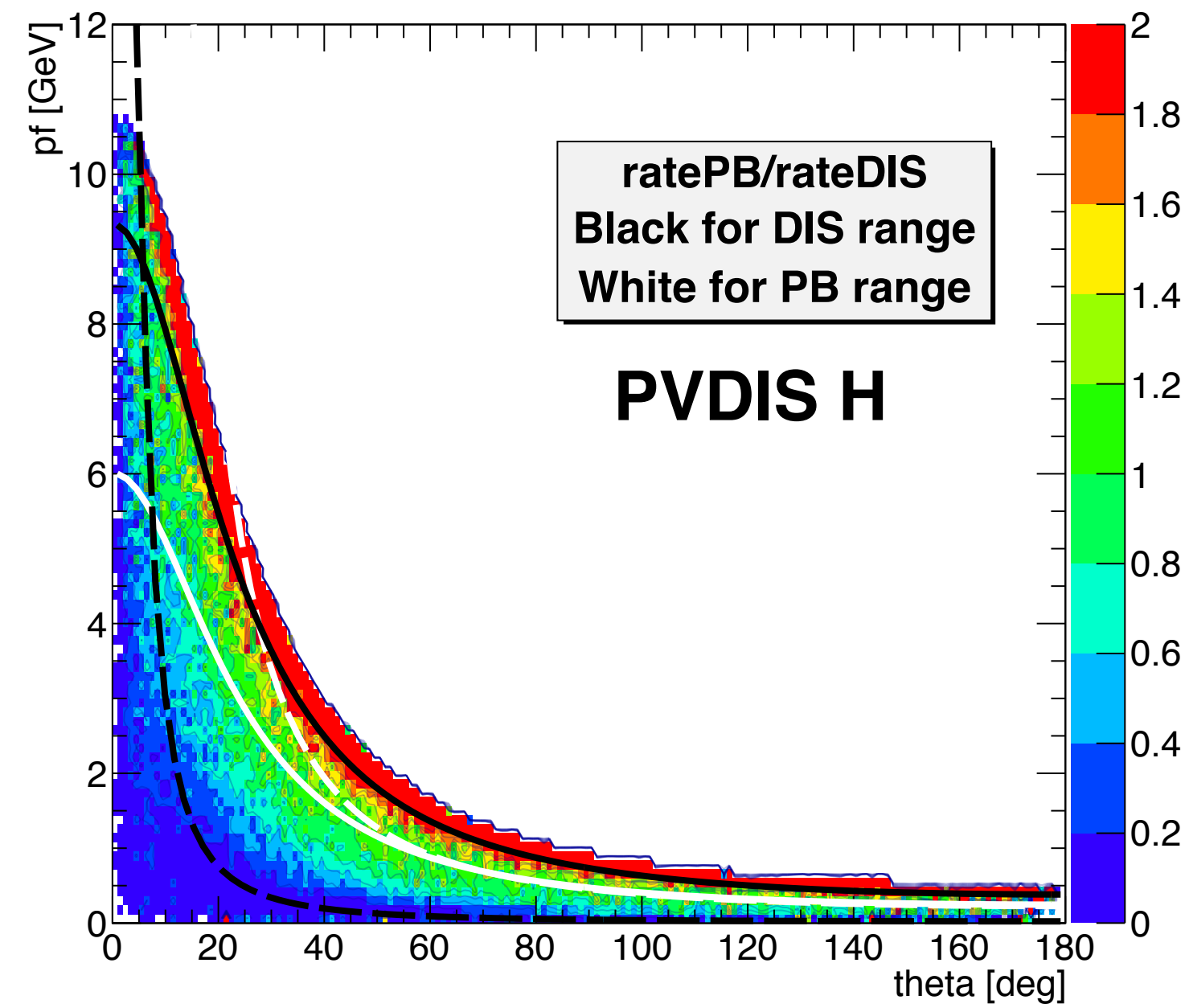


JPsi H target at E0=11GeV



Distribution of Ratio

$$\frac{Rate_{PB}}{Rate_{DIS}}$$



The two models give different results,
ratio in common range is about

0.5~4

Potential problems with current model

- Coding errors when using cteq6 library
- Physics reasons when current model uses PDF fittings
- Both are right, but different functioning ranges. (less likely)
- Unrealized problems with PB
- Which one is right? which one should I use? (PB)

Summary

- successful software transplantation, producing simulations that agree with data of different nucleus.
- Notable difference exists. 0.5~4 ratio in common range; 0~2.5 in other DIS range; 1 around W2~16;
- Ratio distributions have minor difference between nucleus, but share the same pattern.
- Further research: what causes the difference? which one is more reliable?

