

**Rare Phenomena and  $W$  Production  
in  
Electron-Proton Scattering at HERA**

*Appendix*



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# Contents

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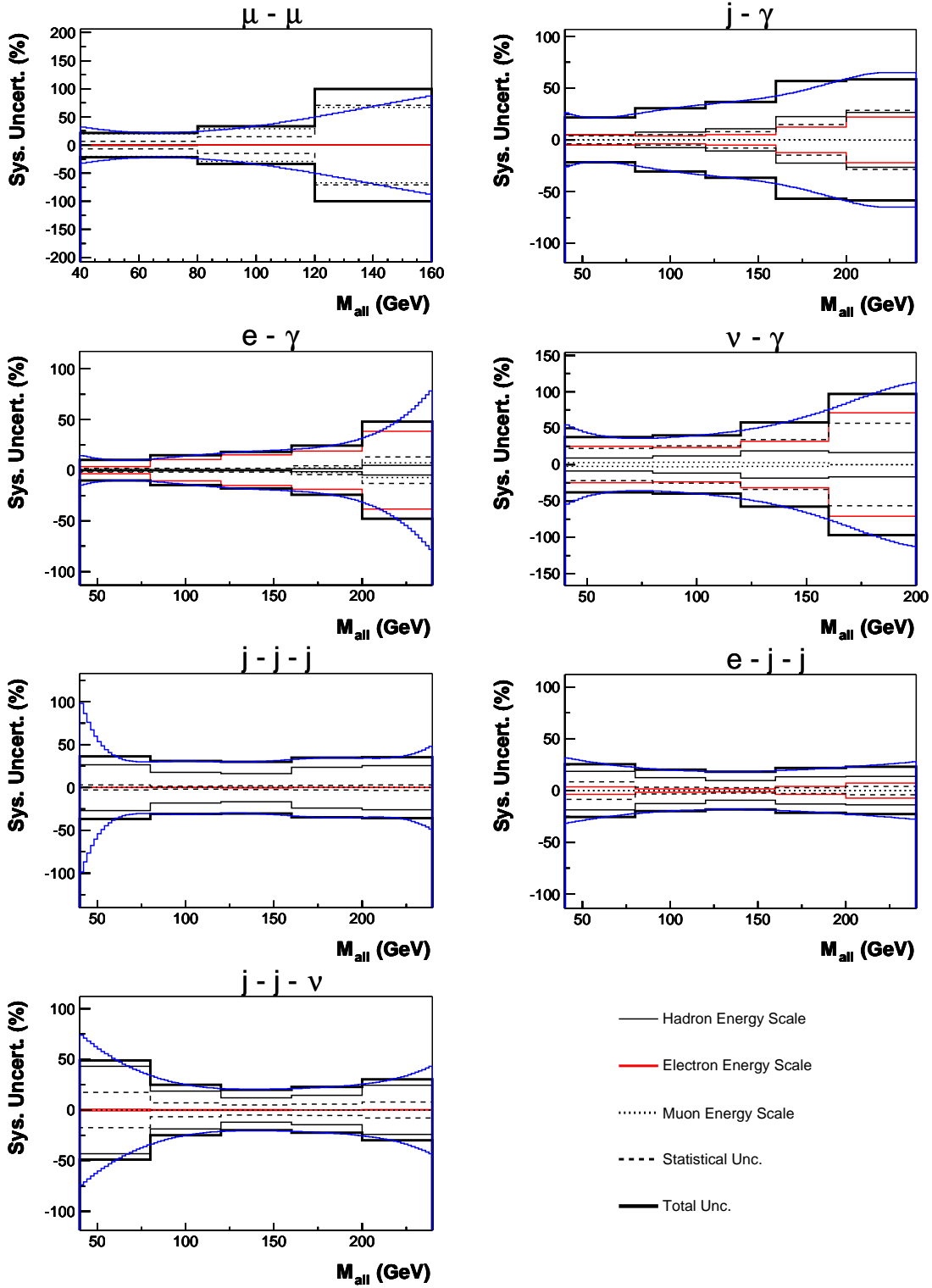


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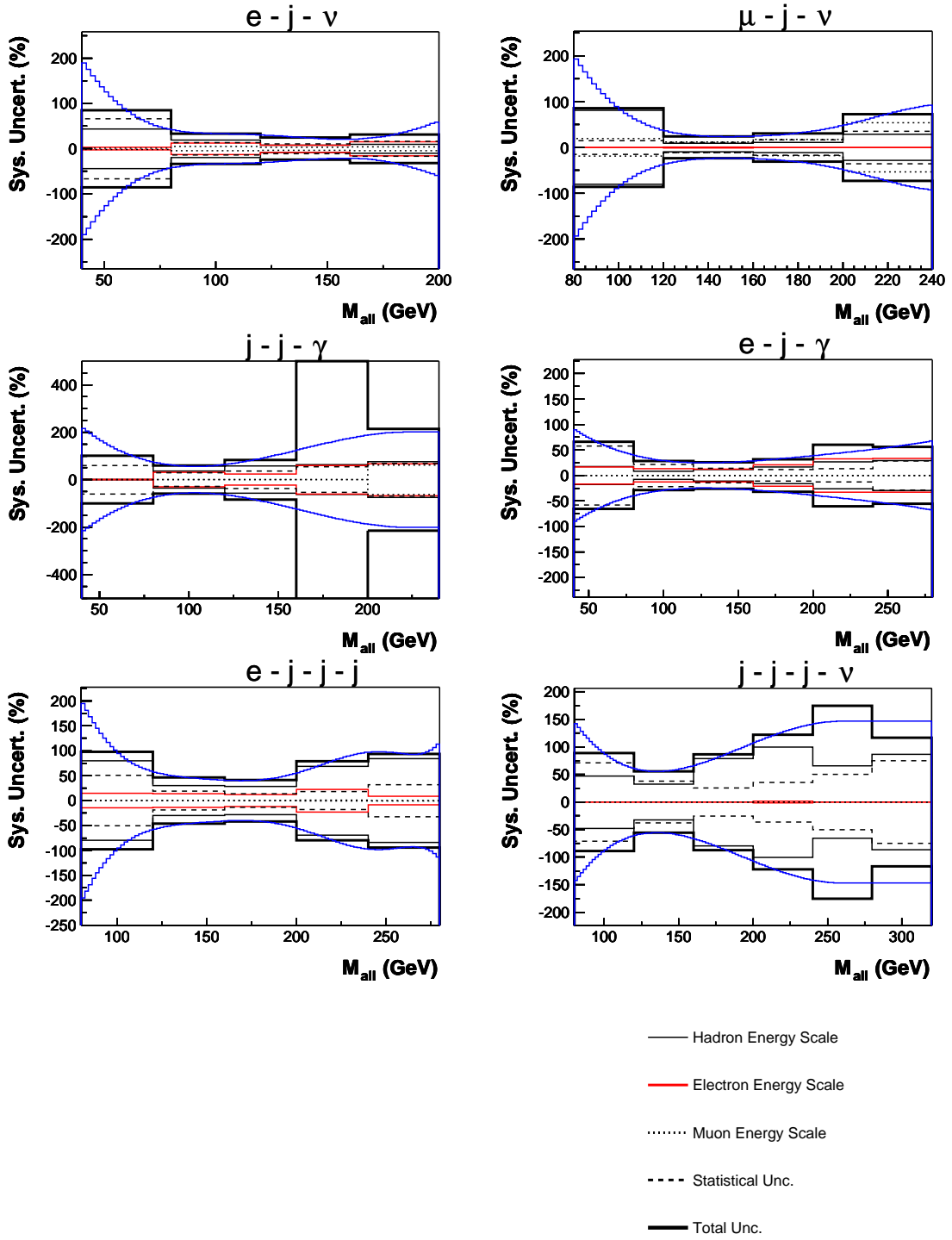
# Systematic Uncertainties

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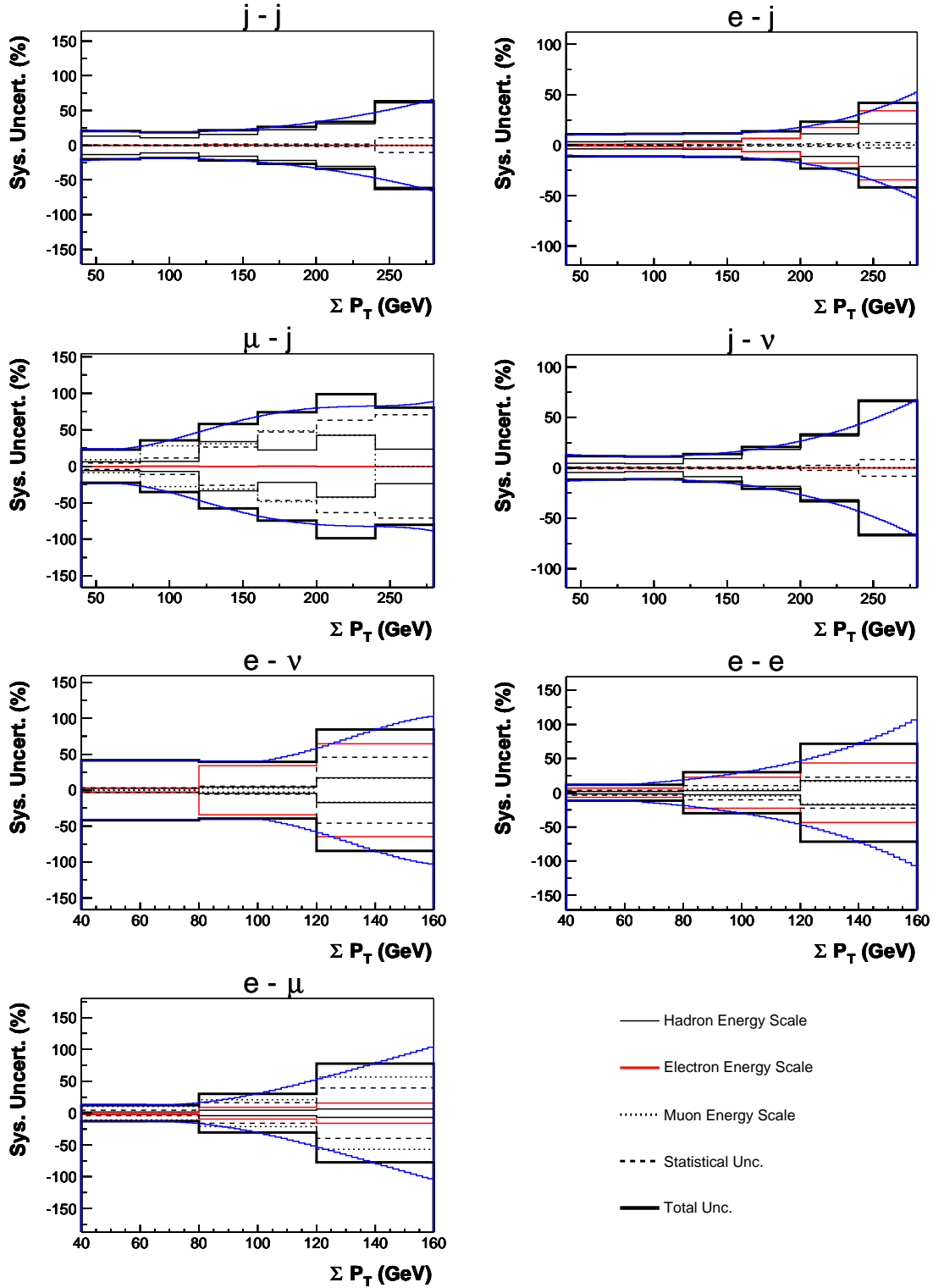
This section is a complement to sec. 4.10. Figs. A.1- A.5 show the fitted distribution of the systematic uncertainties on the predicted number of events as a function of the  $M_{\text{all}}$  and  $\sum P_T$  for the event classes or distributions which have not been presented in sec. 4.10.



**Figure A.1:** Systematic uncertainties on the predicted number of events as a function of  $M_{\text{all}}$  for different event classes. Only the total uncertainty and the corresponding fit, as well as the uncertainties arising from the energy scales and the statistics are shown.

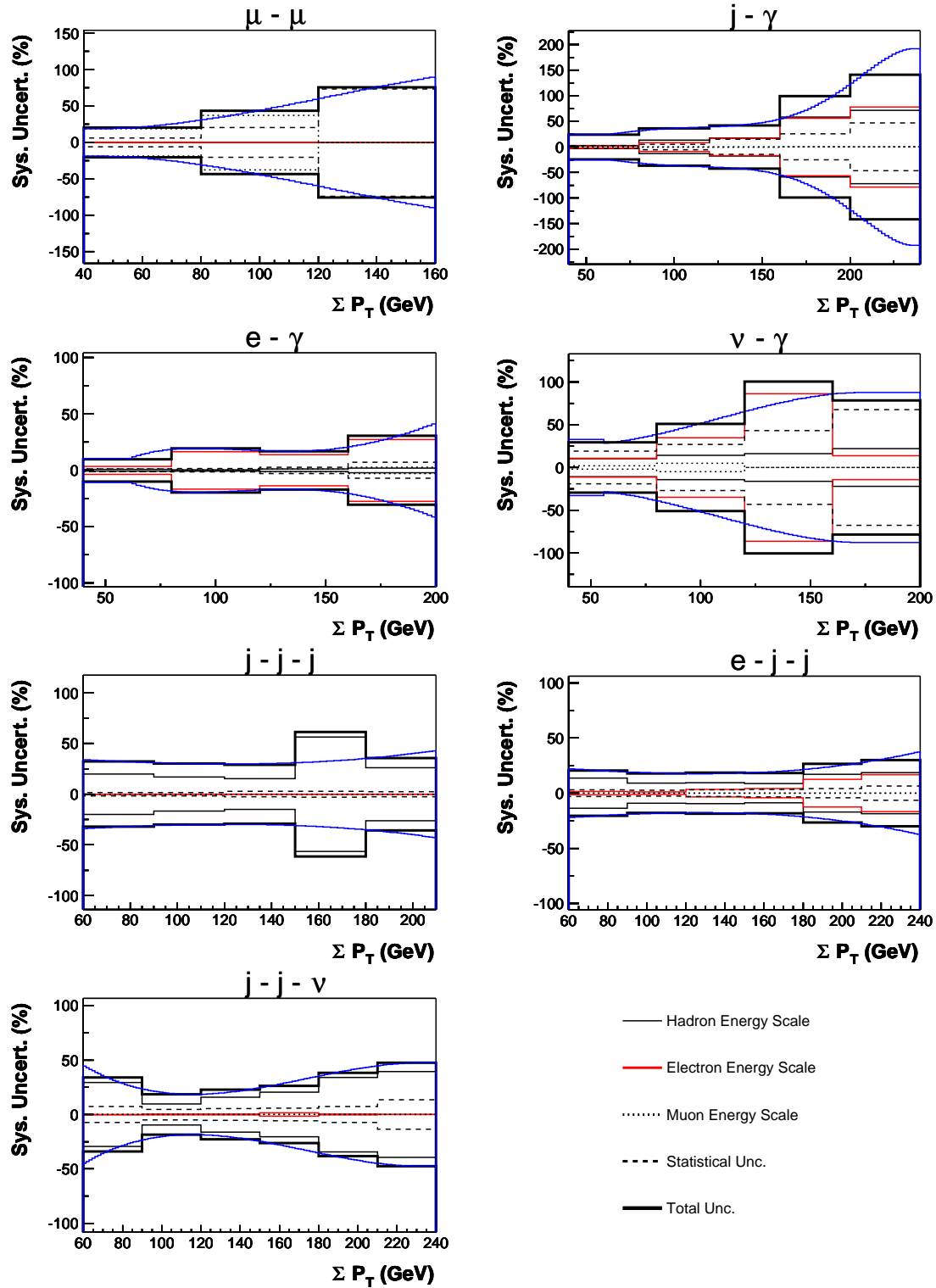


**Figure A.2:** Systematic uncertainties on the predicted number of events as a function of  $M_{\text{all}}$  for different event classes. Only the total uncertainty and the corresponding fit, as well as the uncertainties arising from the energy scales and the statistics are shown.

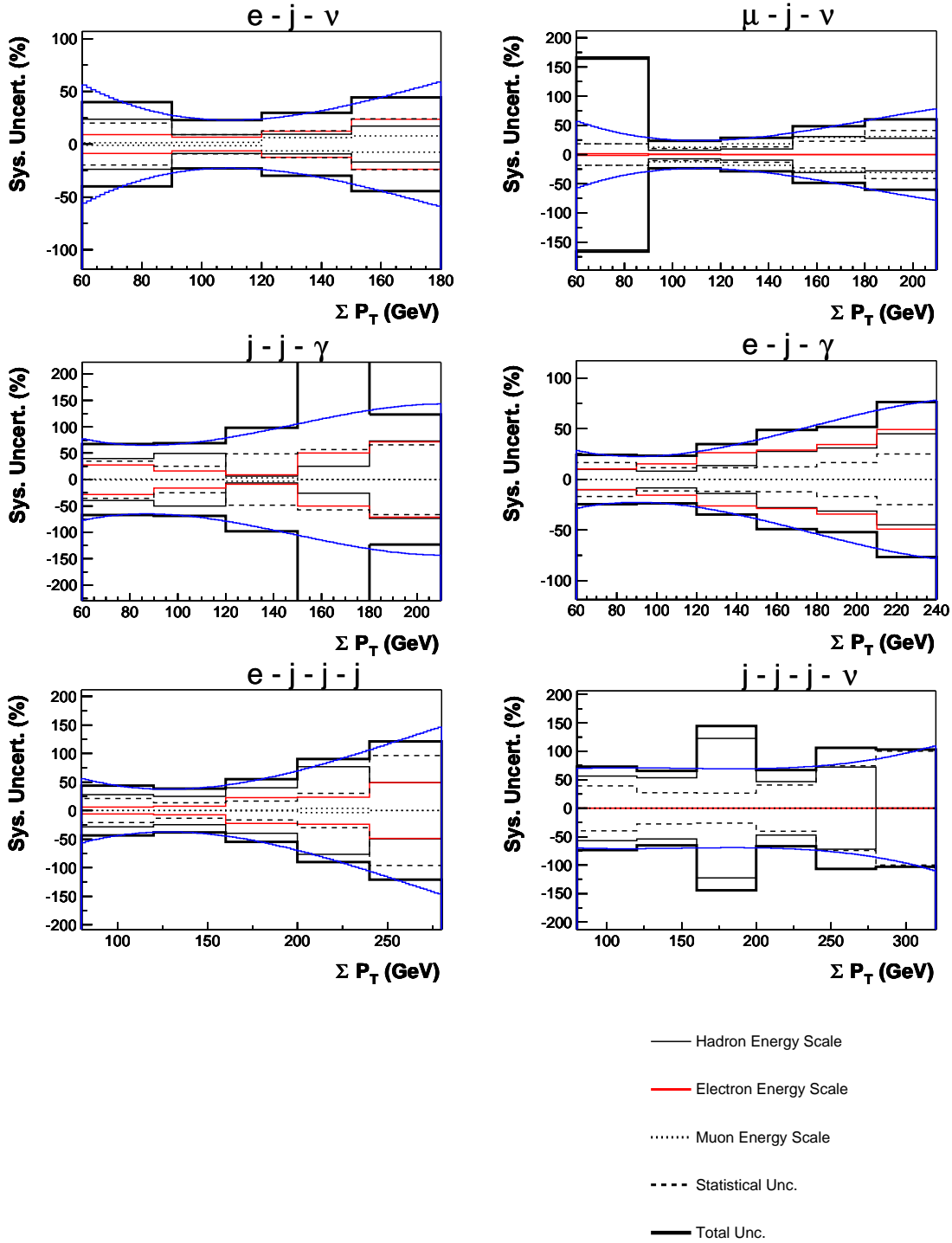


**Figure A.3:** Systematic uncertainties on the predicted number of events as a function of  $\sum P_T$  for different event classes. Only the total uncertainty and the corresponding fit, as well as the uncertainties arising from the energy scales and the statistics are shown.





**Figure A.4:** Systematic uncertainties on the predicted number of events as a function of  $\Sigma P_T$  for different event classes. Only the total uncertainty and the corresponding fit, as well as the uncertainties arising from the energy scales and the statistics are shown.



**Figure A.5:** Systematic uncertainties on the predicted number of events as a function of  $\Sigma P_T$  for different event classes. Only the total uncertainty and the corresponding fit, as well as the uncertainties arising from the energy scales and the statistics are shown.

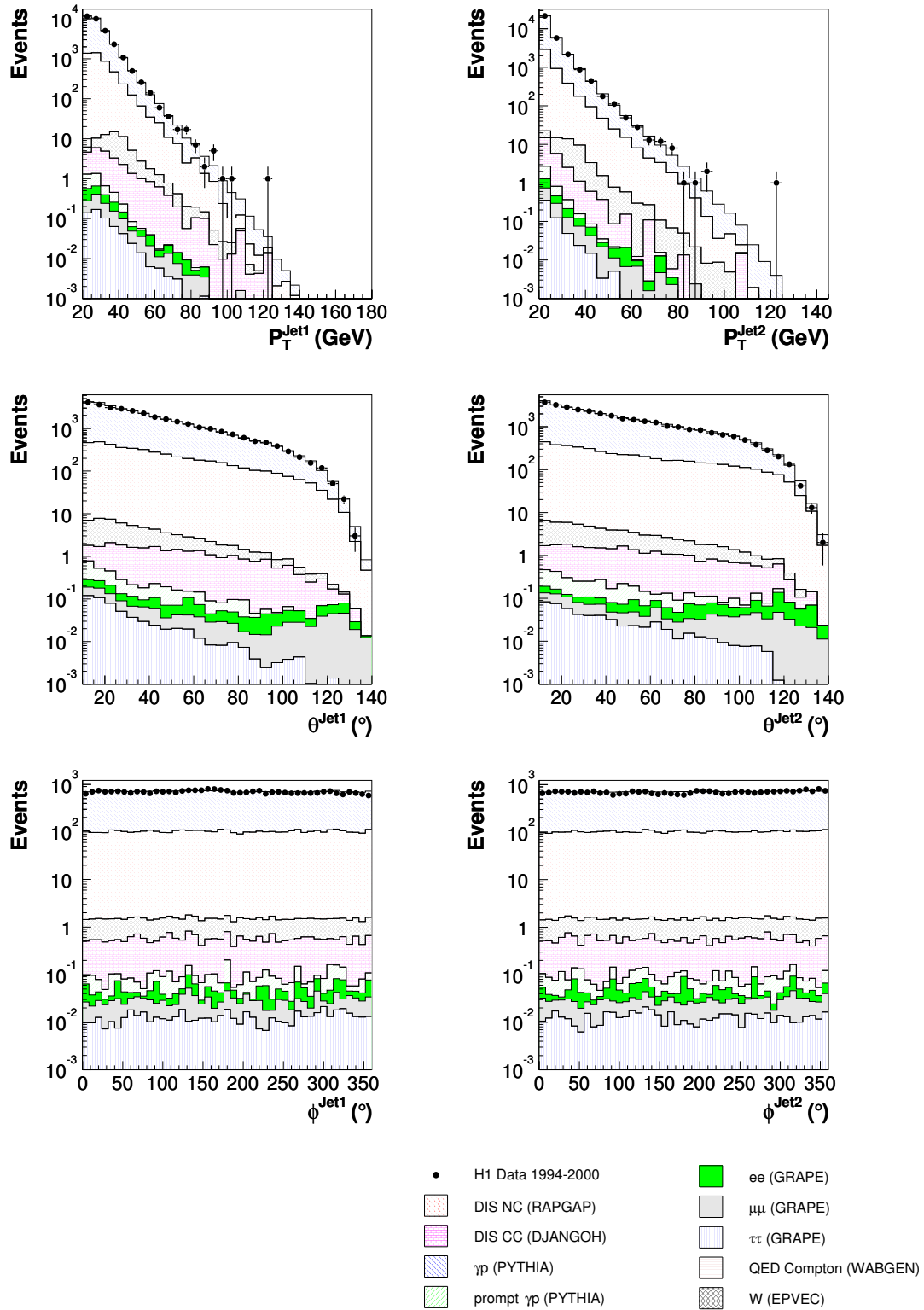
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# Control Distributions

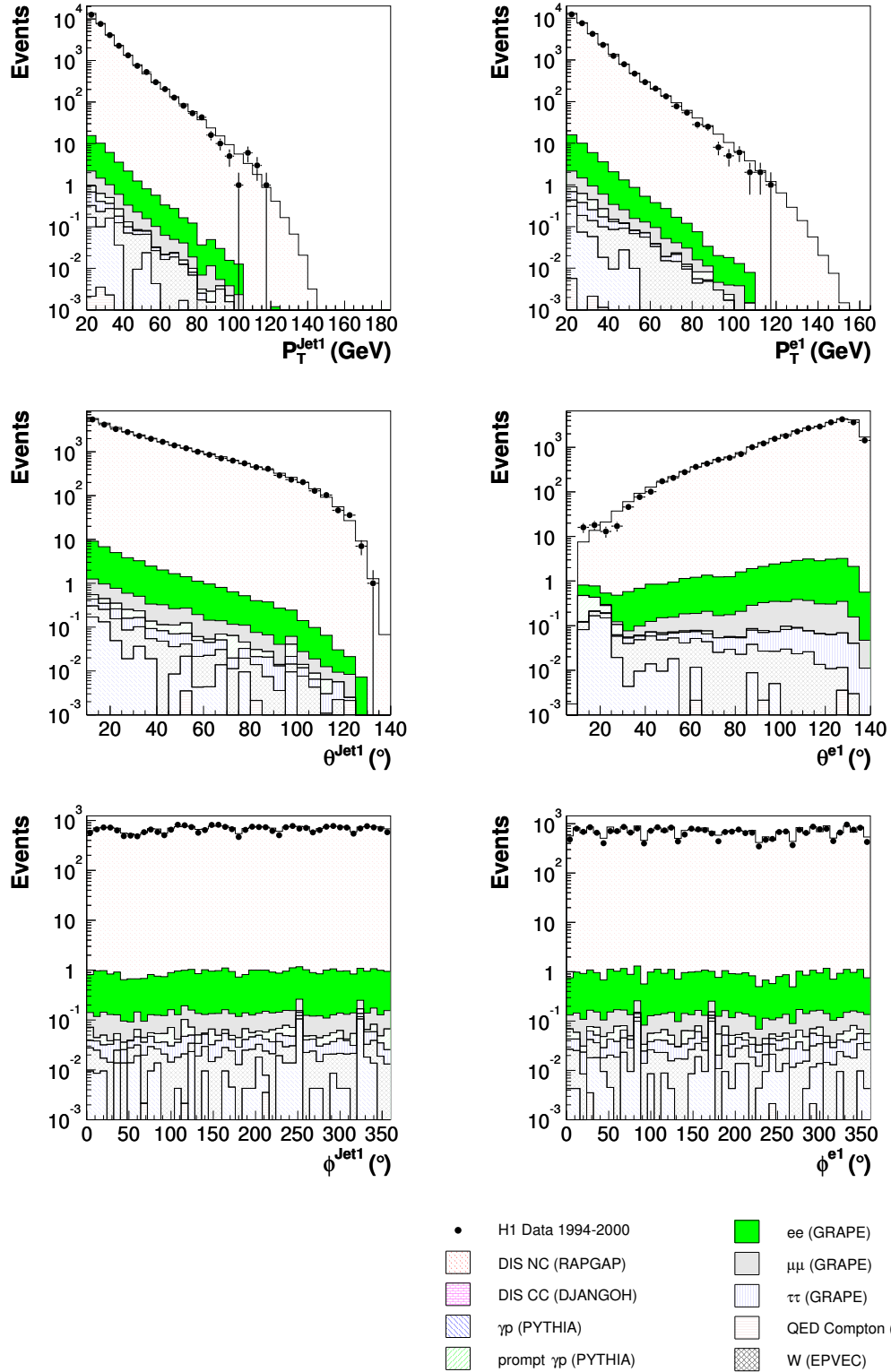
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The figures presented in this section show the transverse momenta, as well as the polar and azimuthal angles of the selected objects for all event classes which have a SM expectation greater than 0.1 events.

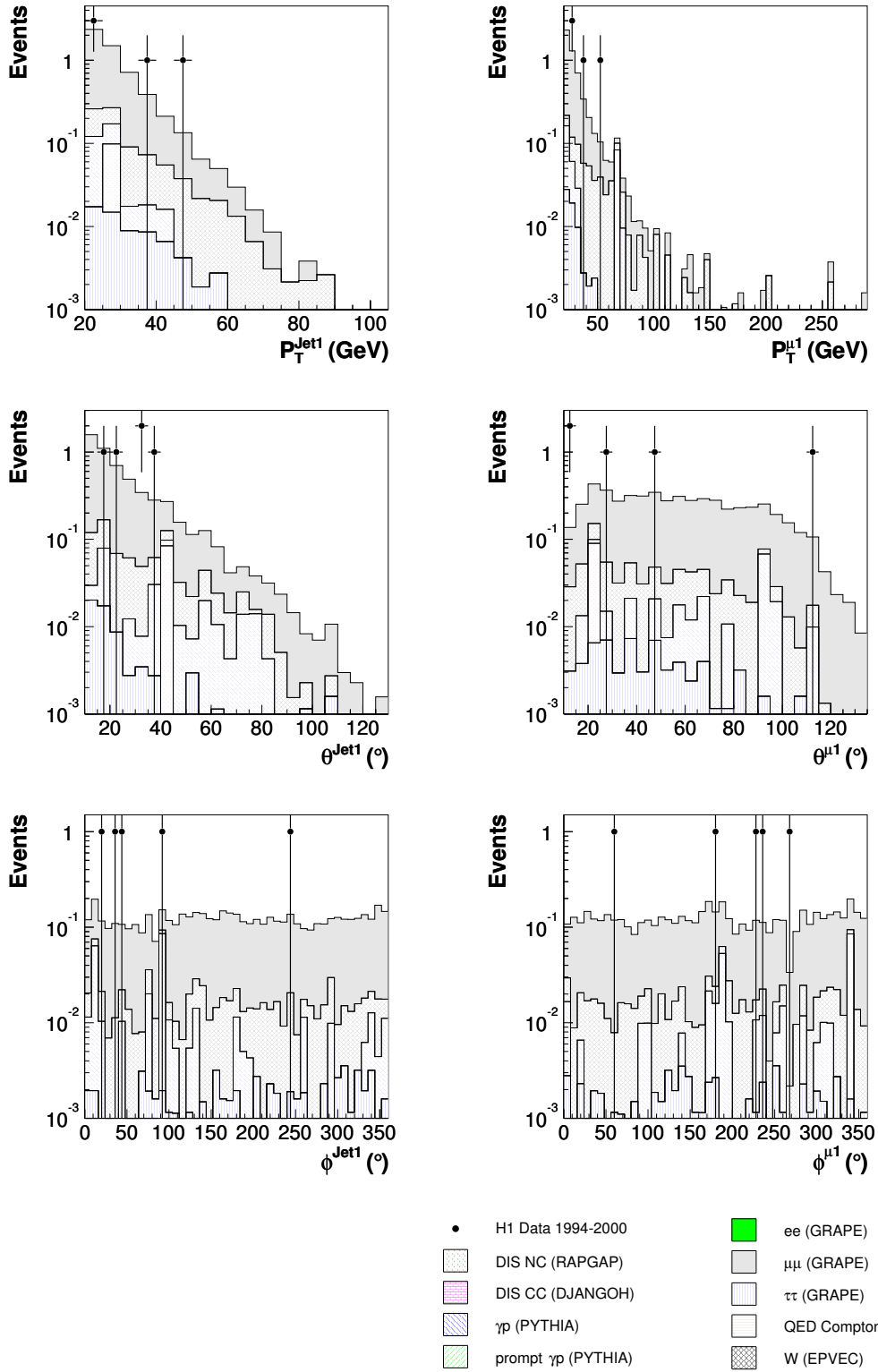
# $j$ - $j$ event class



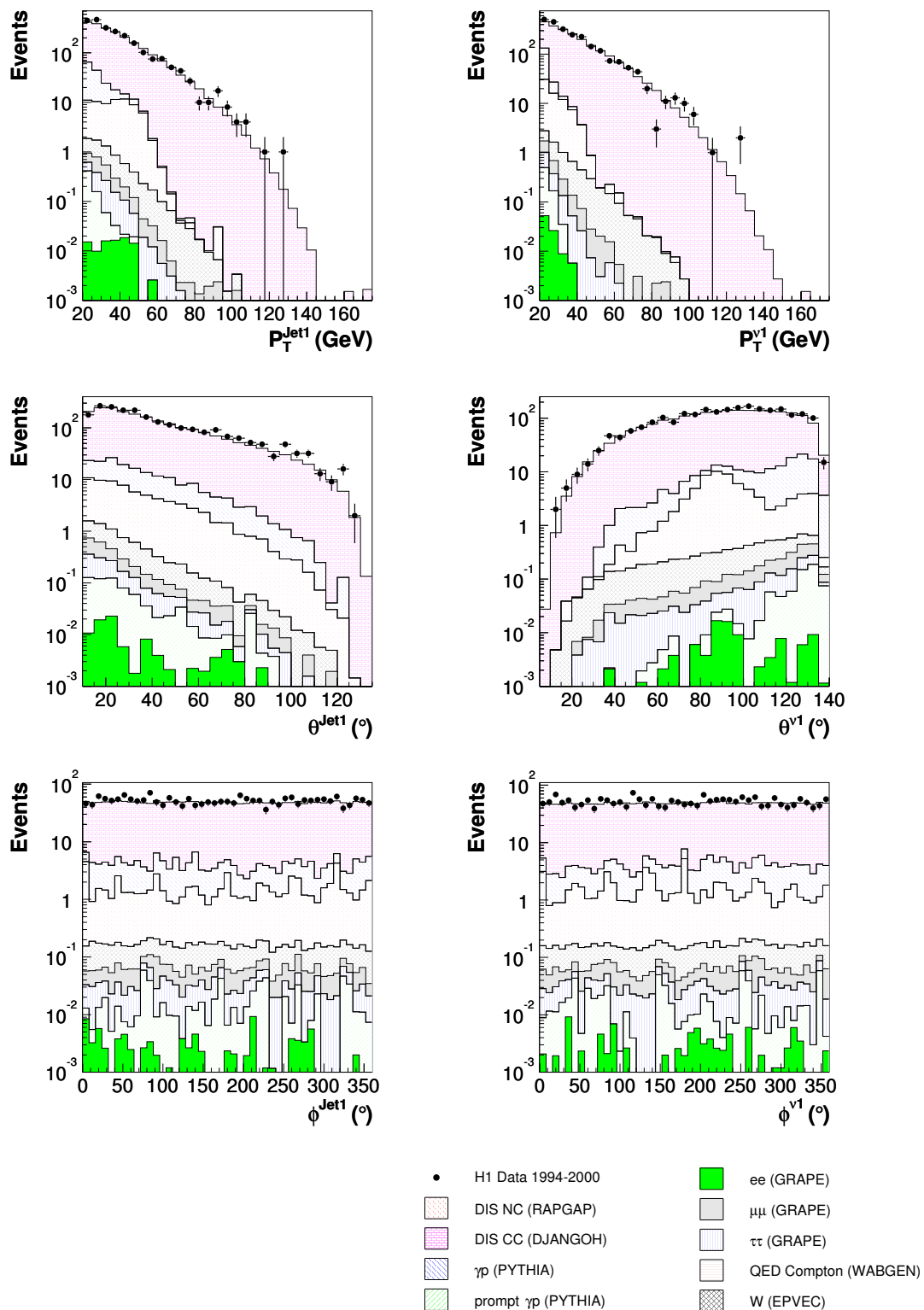
# $e-j$ event class



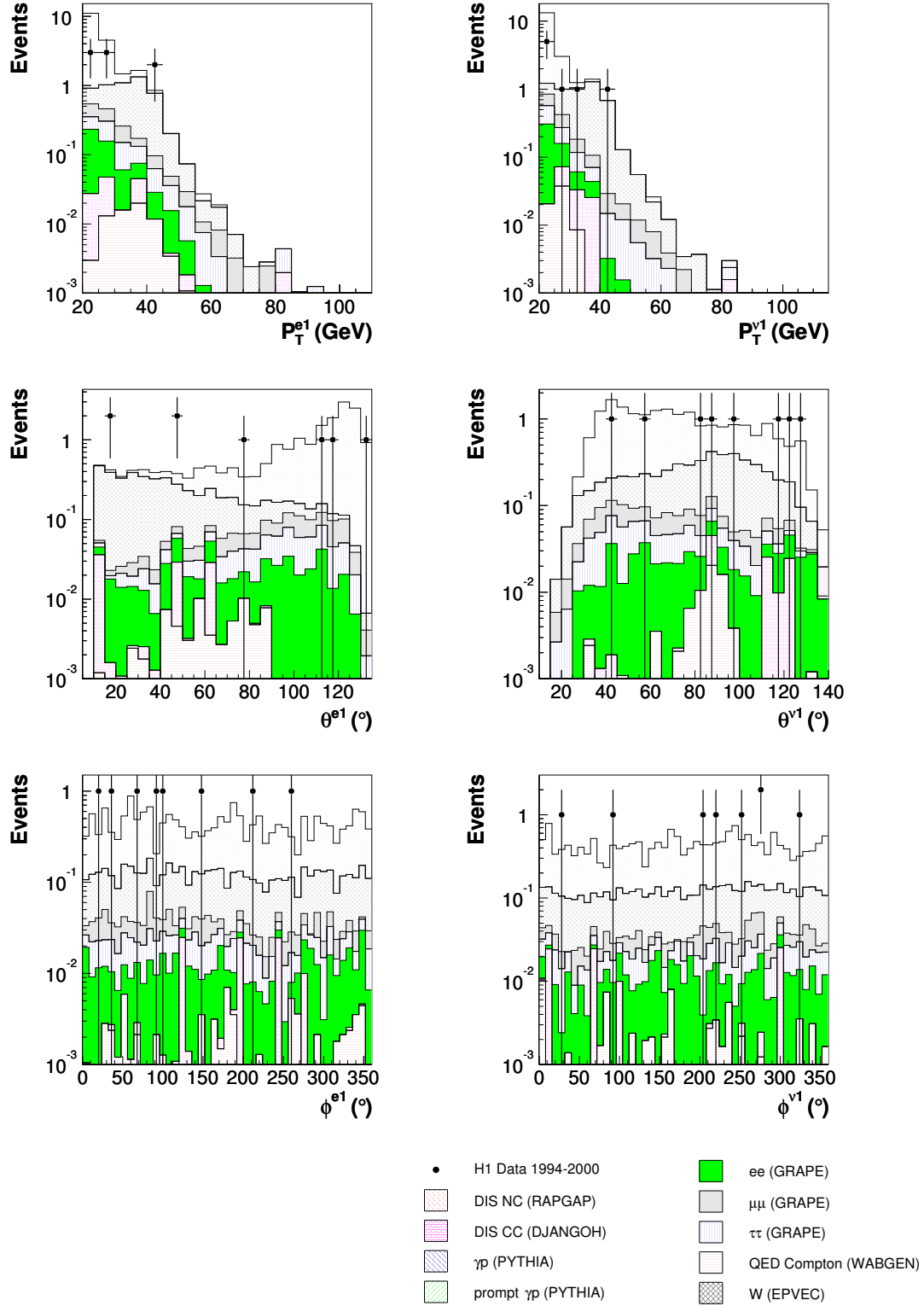
# $\mu$ - $j$ event class



# $j-\nu$ event class

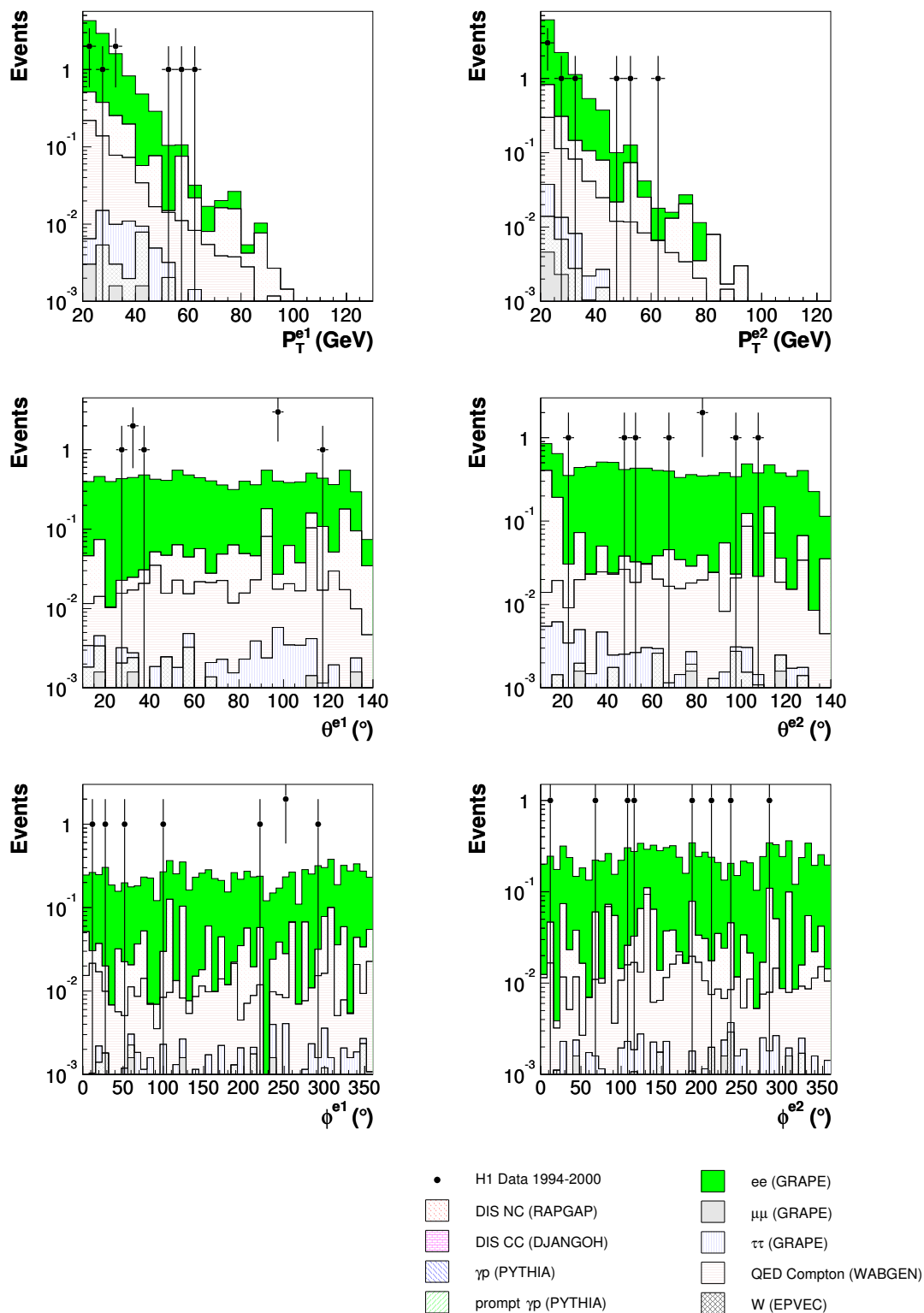


## $e-\nu$ event class

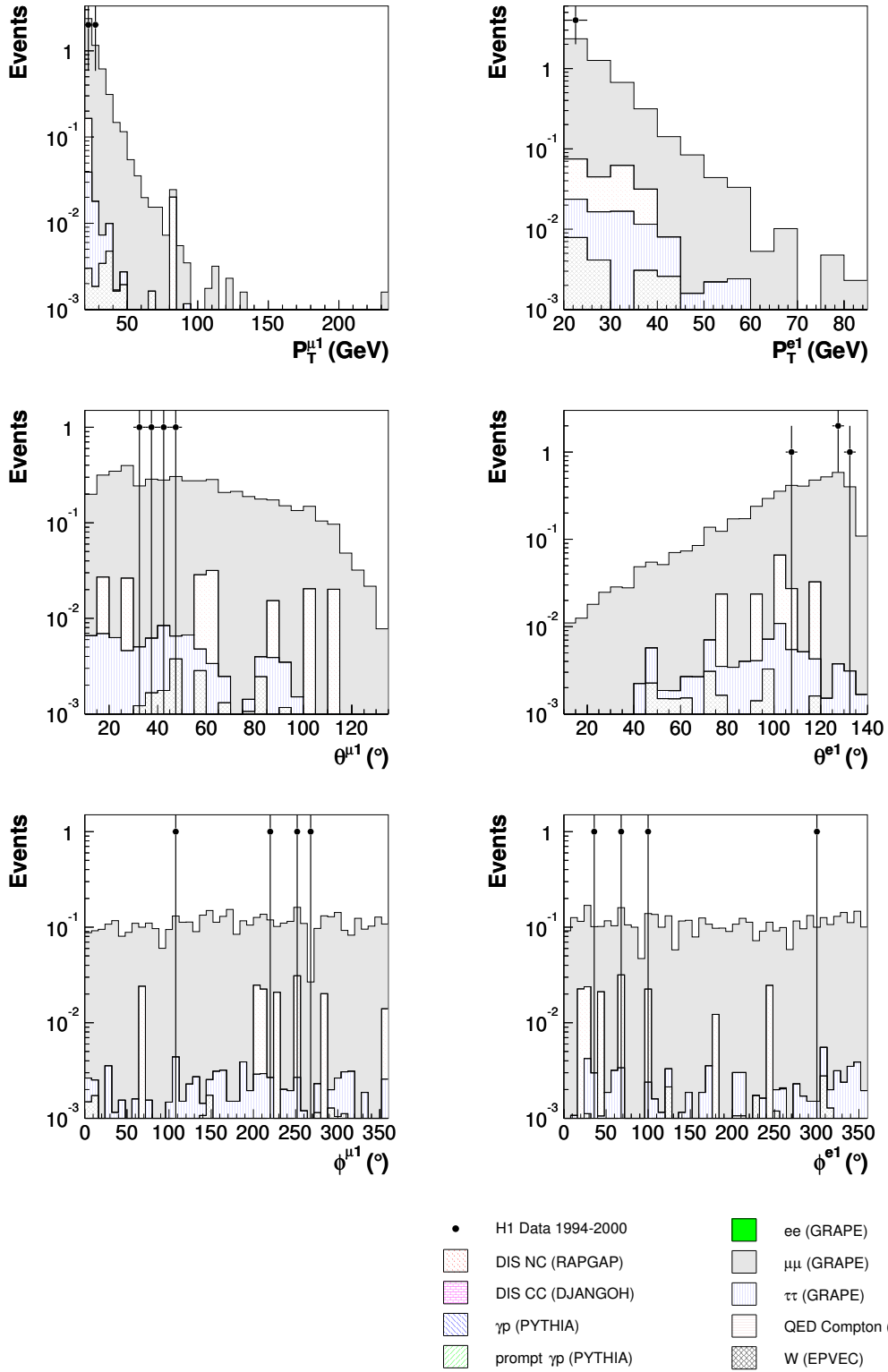




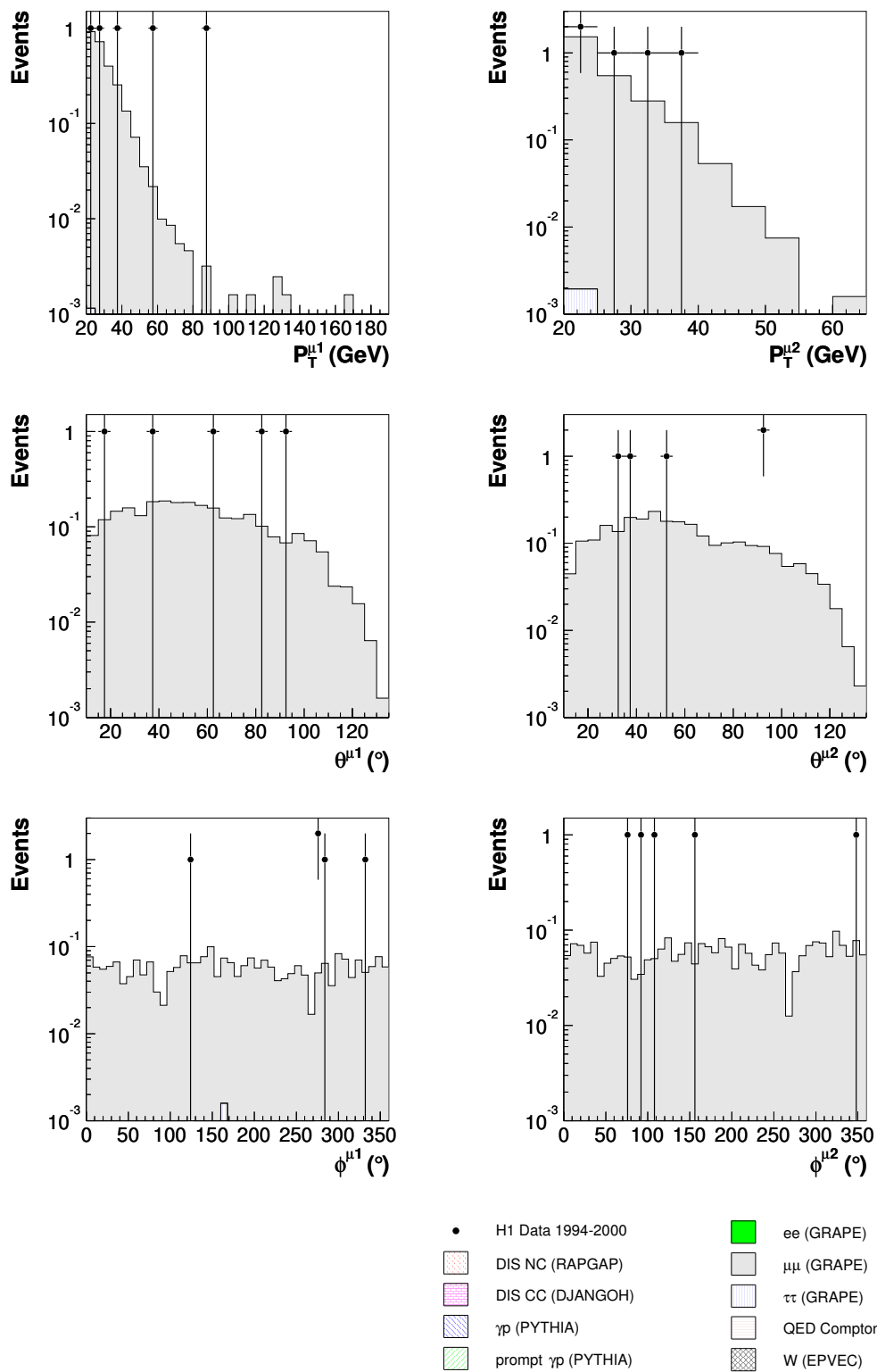
## $e-e$ event class



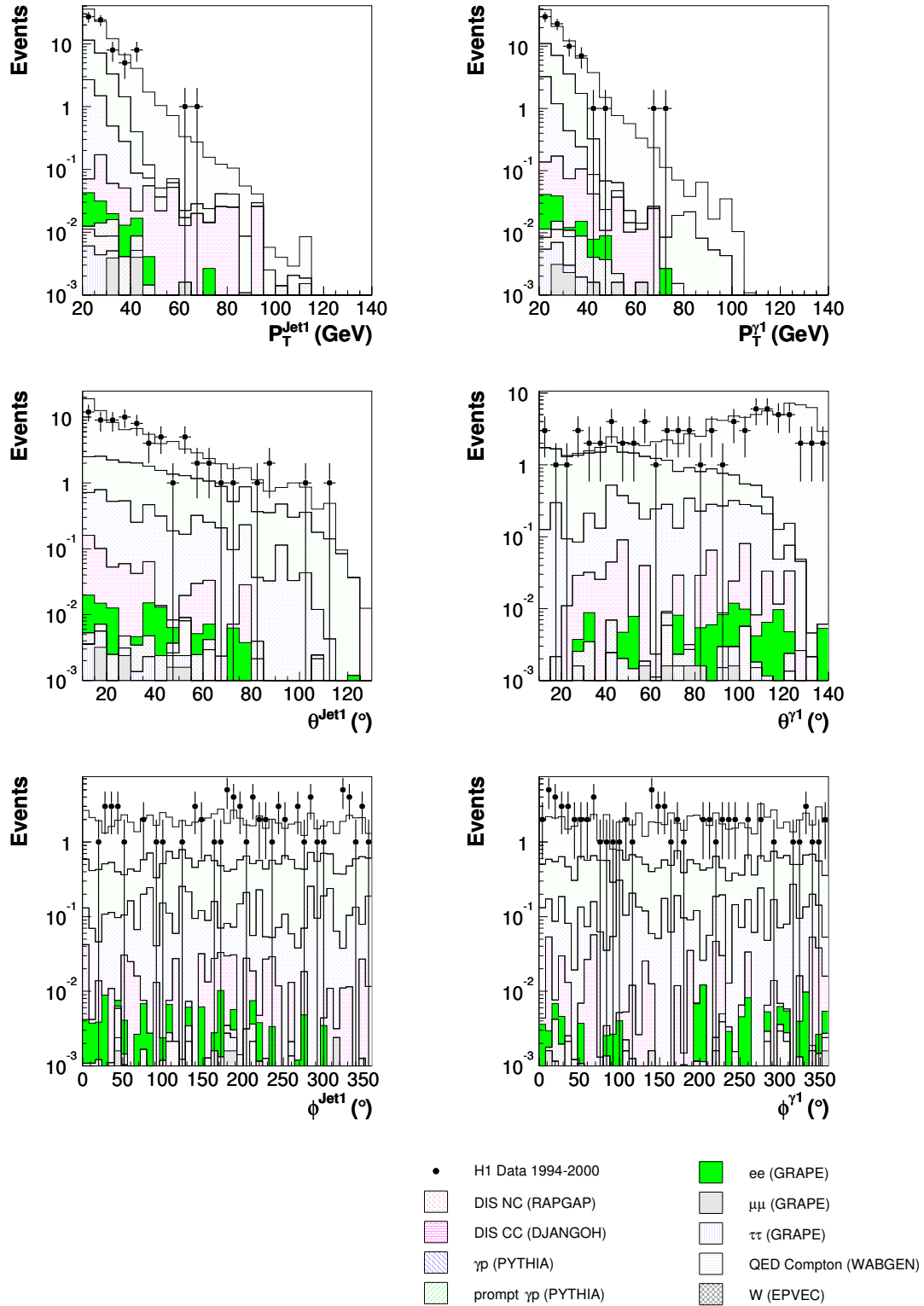
# $e\text{-}\mu$ event class



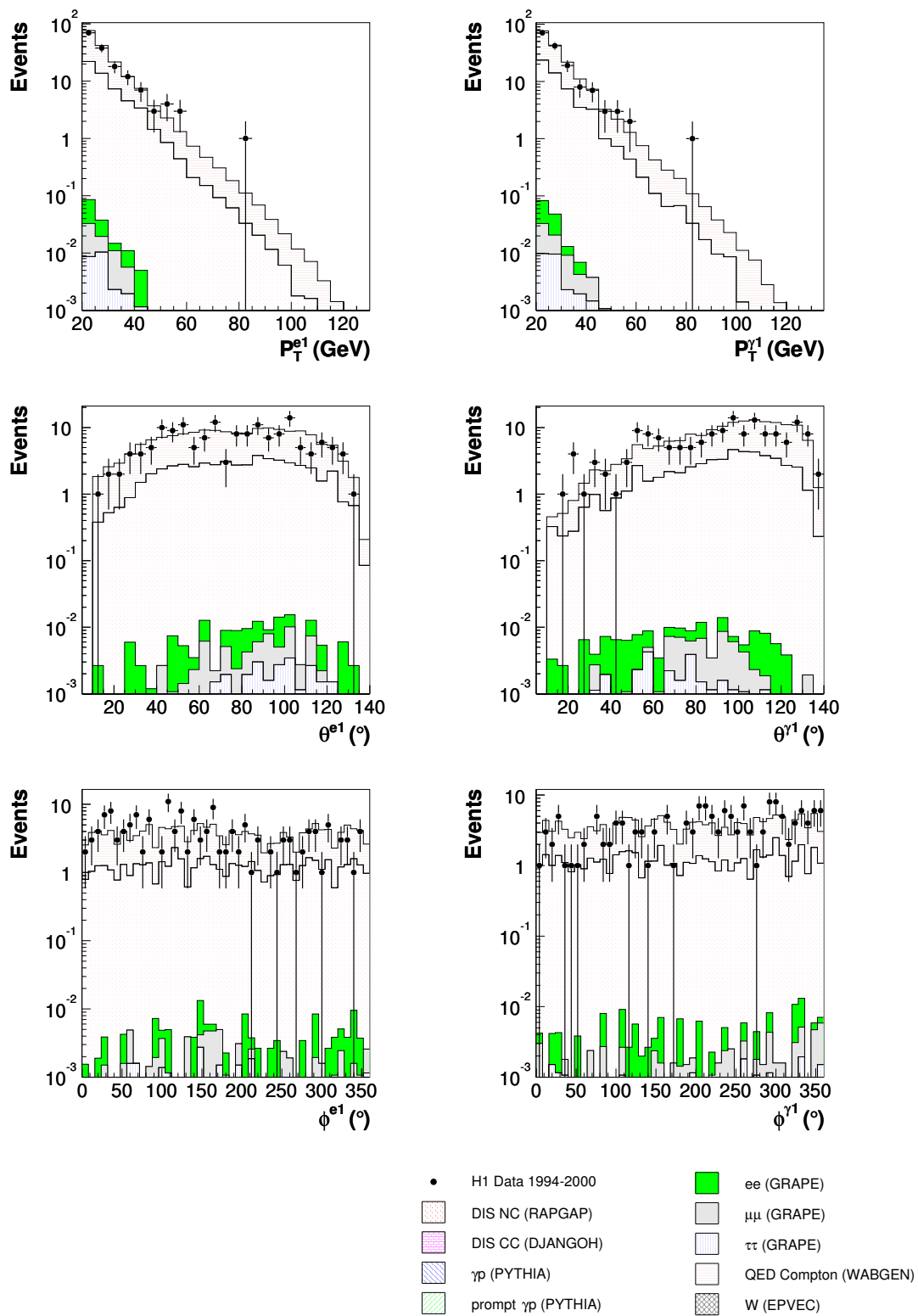
## $\mu\text{-}\mu$ event class



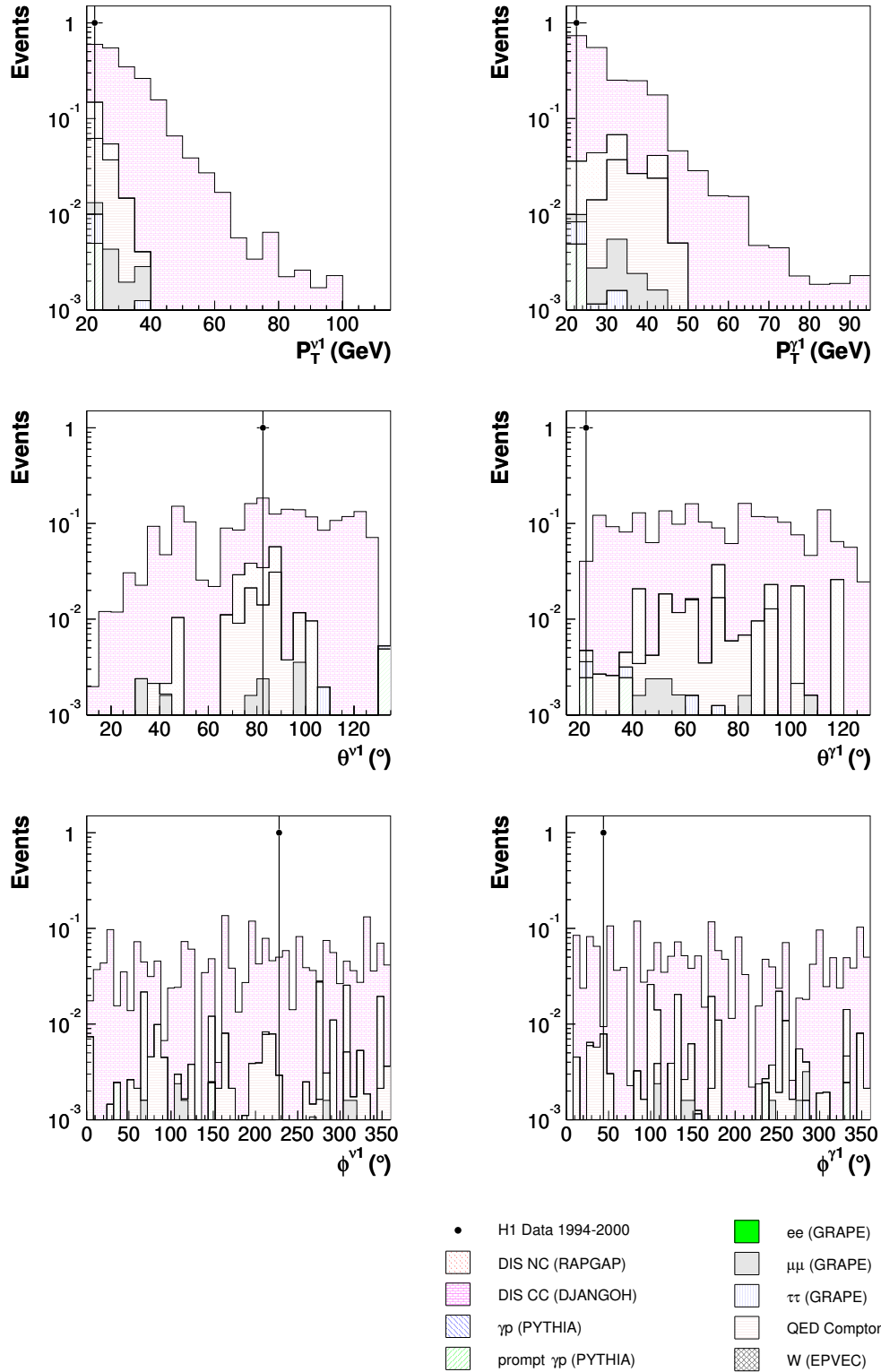
# $j$ - $\gamma$ event class



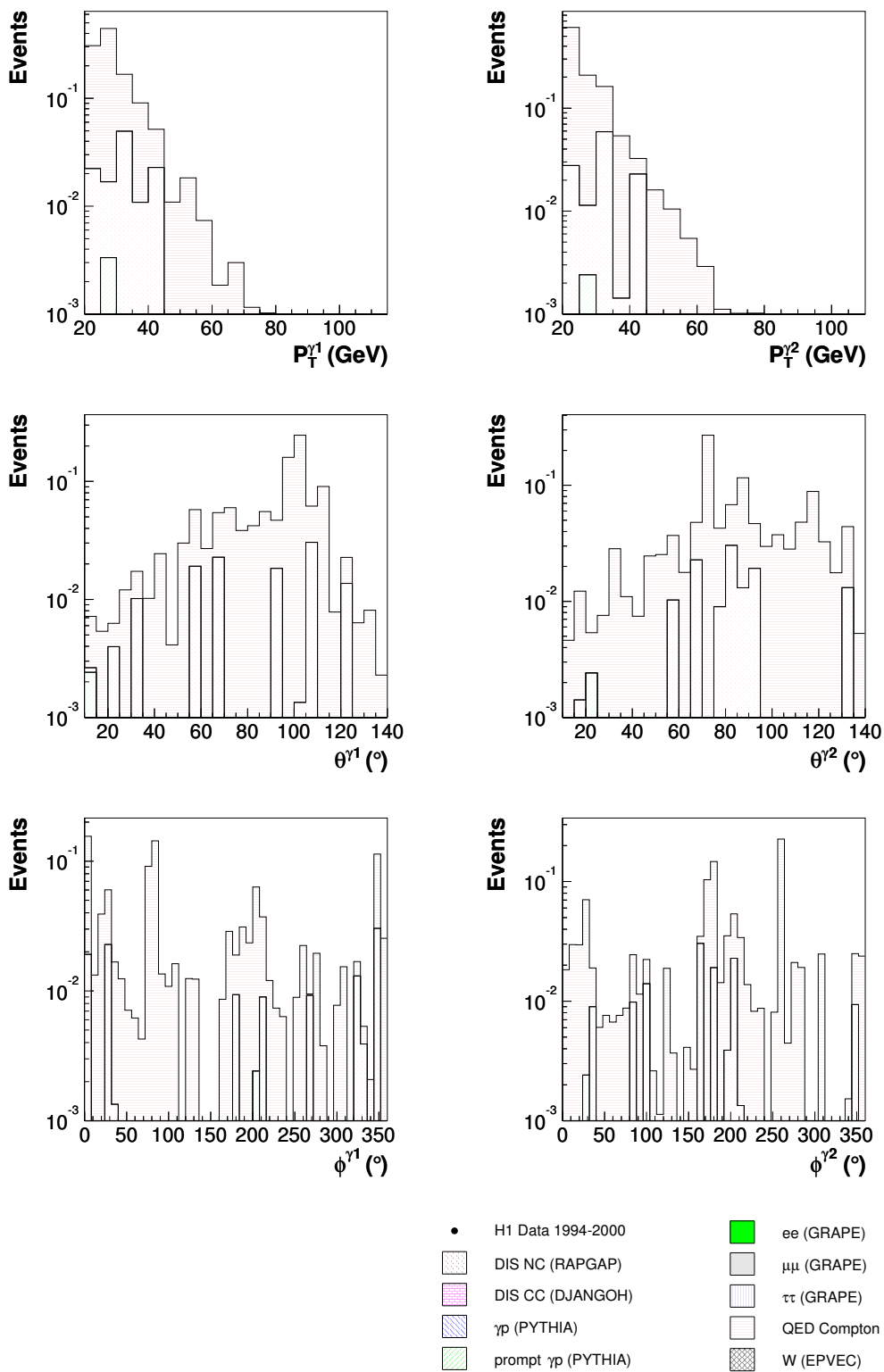
# $e\text{-}\gamma$ event class



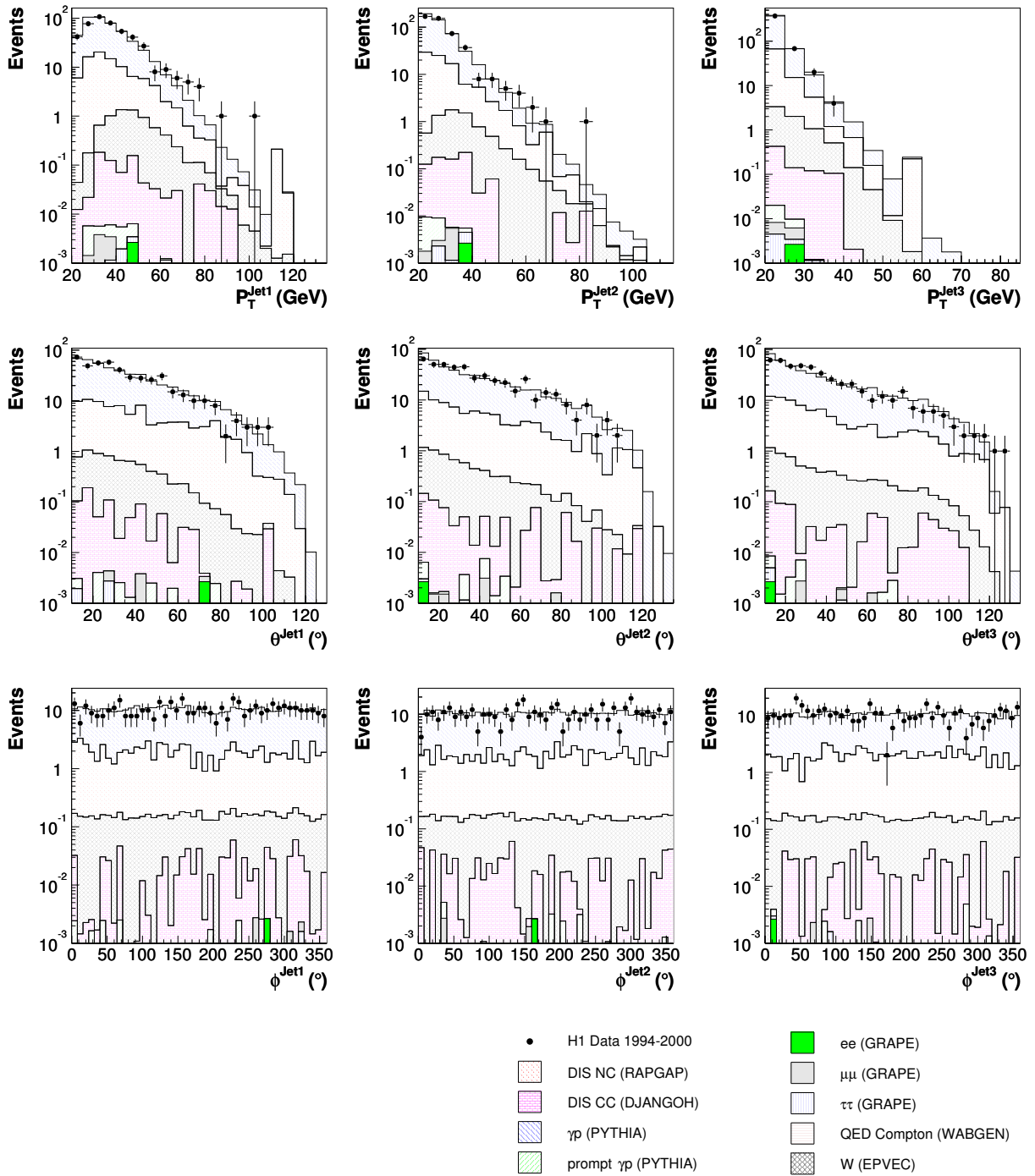
# $\nu$ - $\gamma$ event class



# $\gamma\text{-}\gamma$ event class

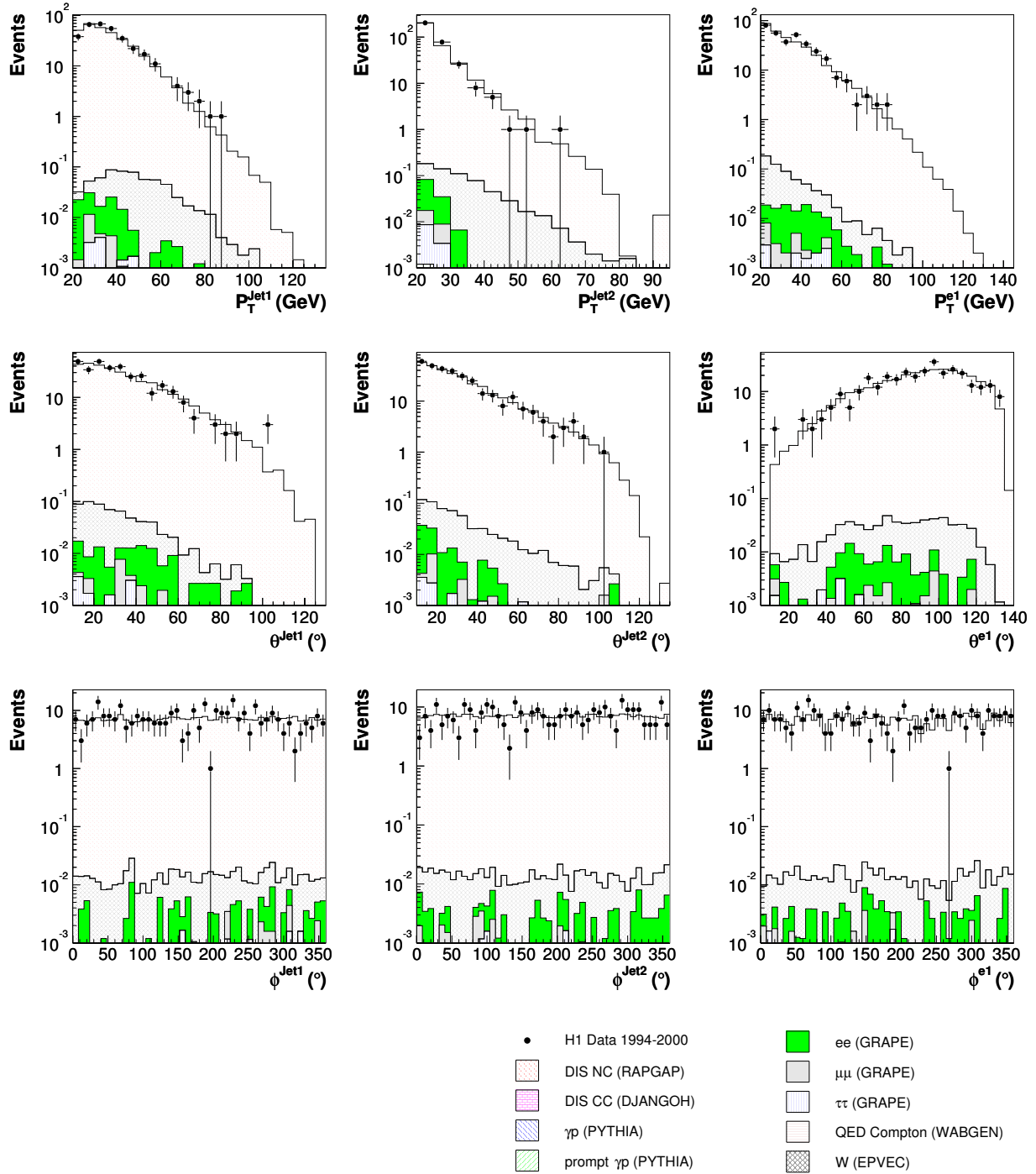


## $j$ - $j$ - $j$ event class

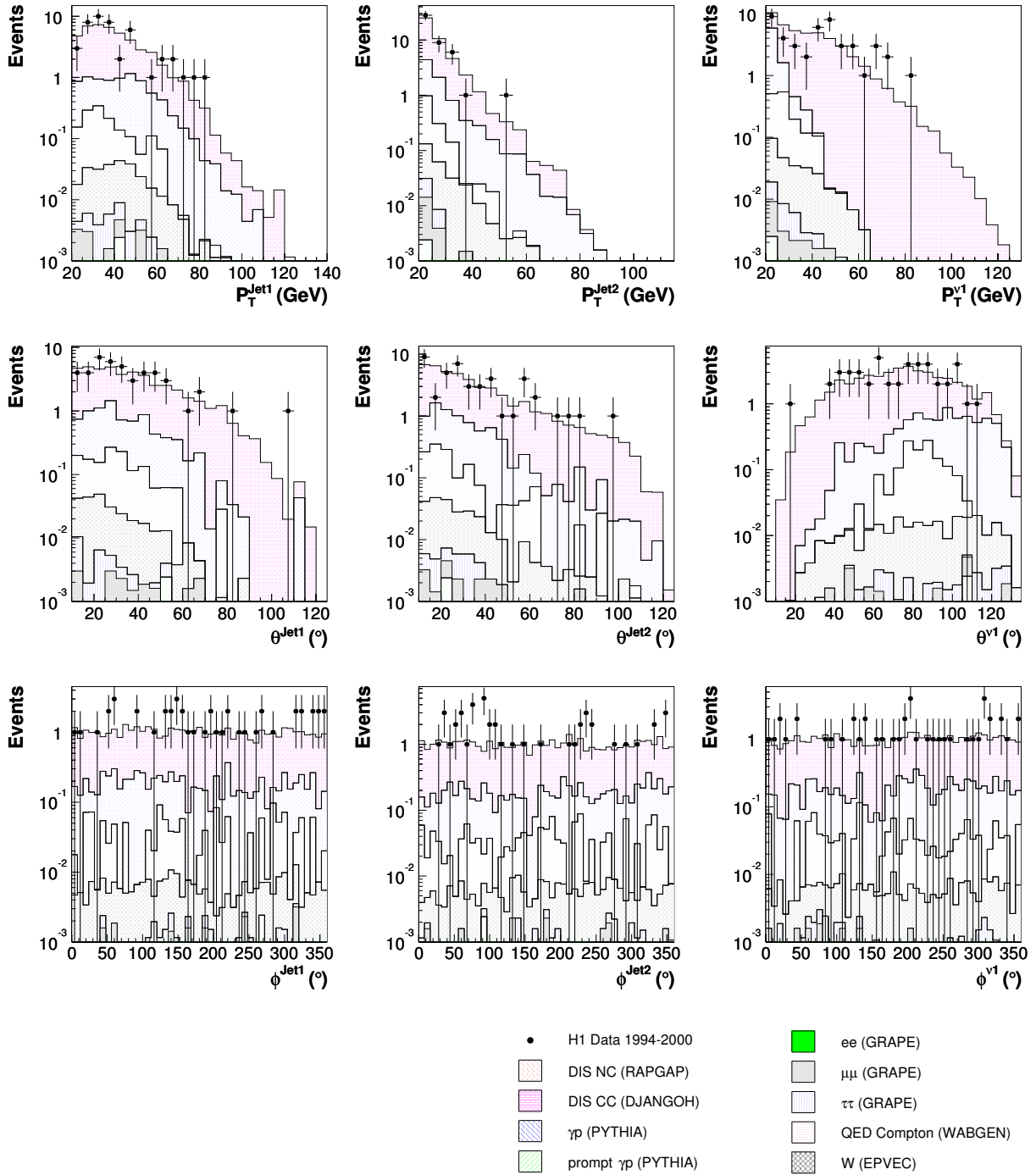




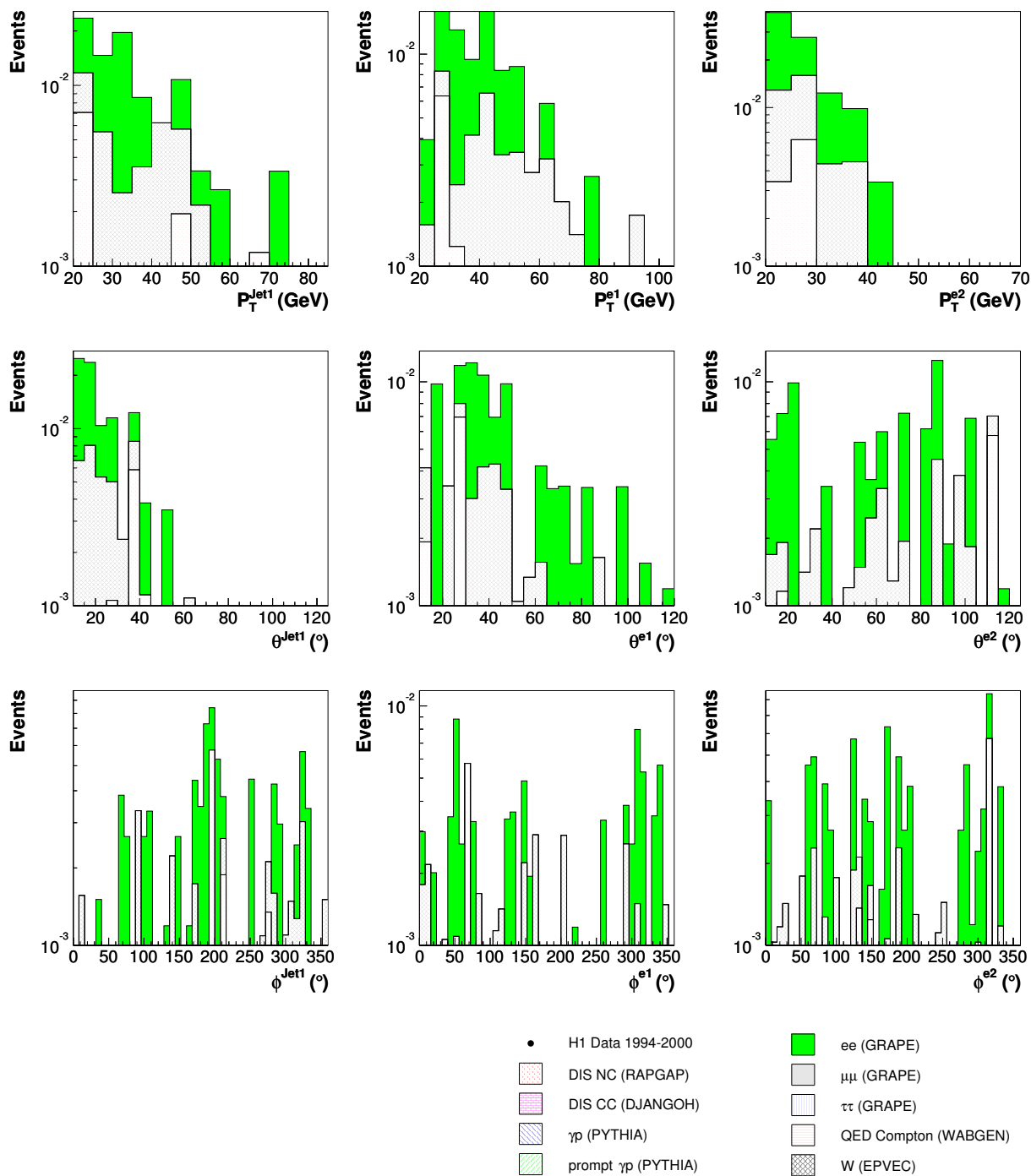
## $e-j-j$ event class



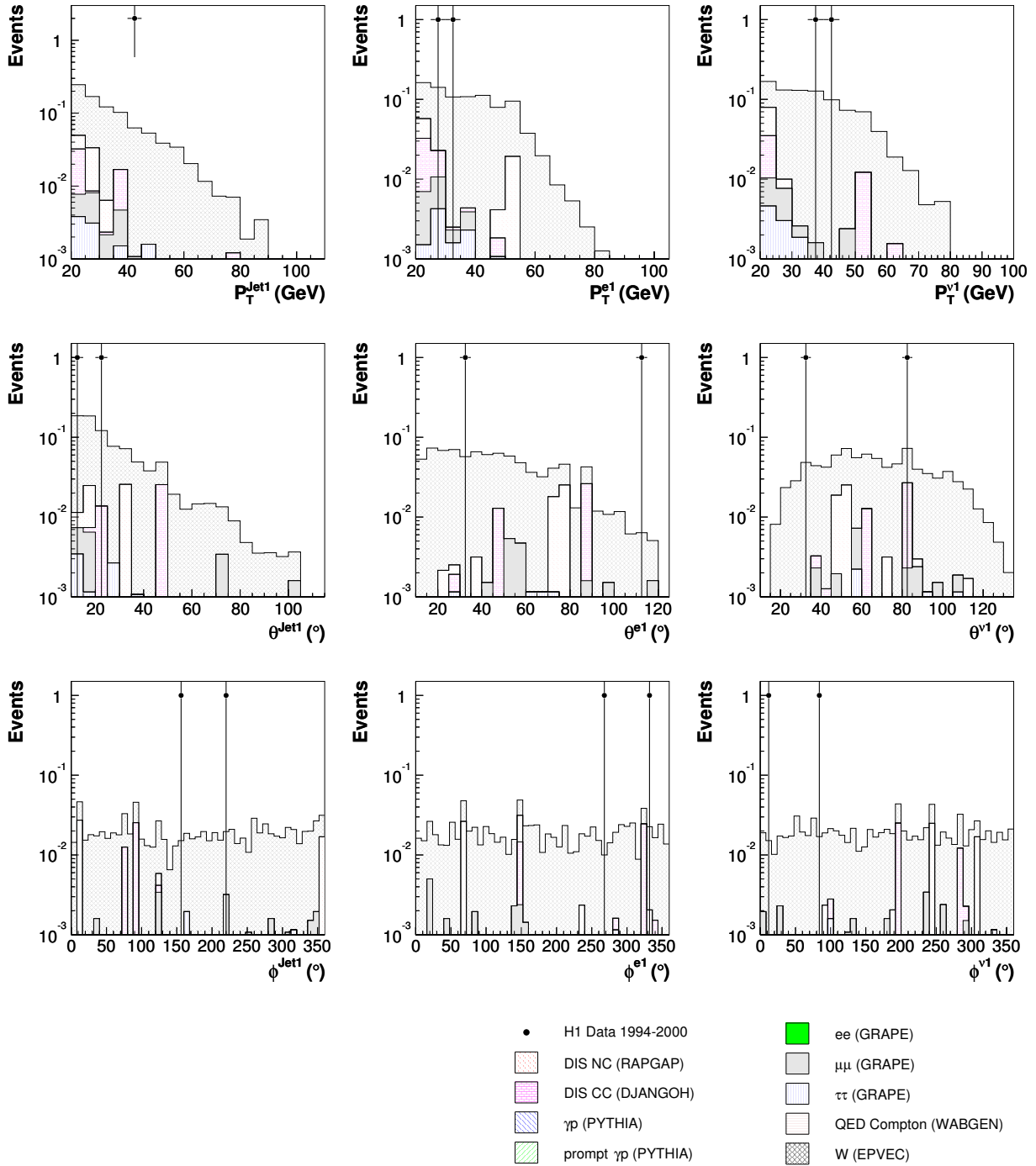
# $j$ - $j$ - $\nu$ event class



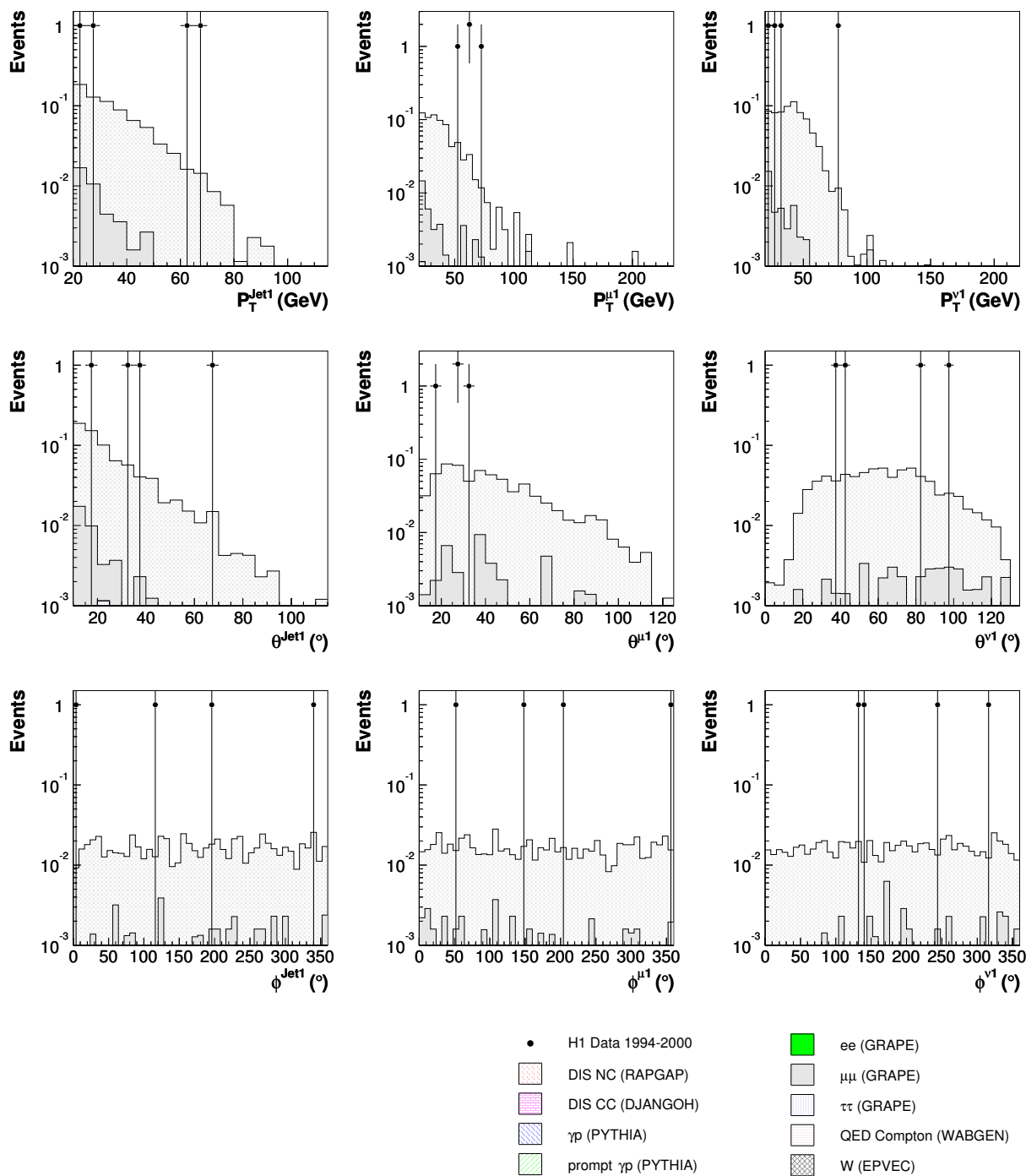
## $e-e-j$ event class



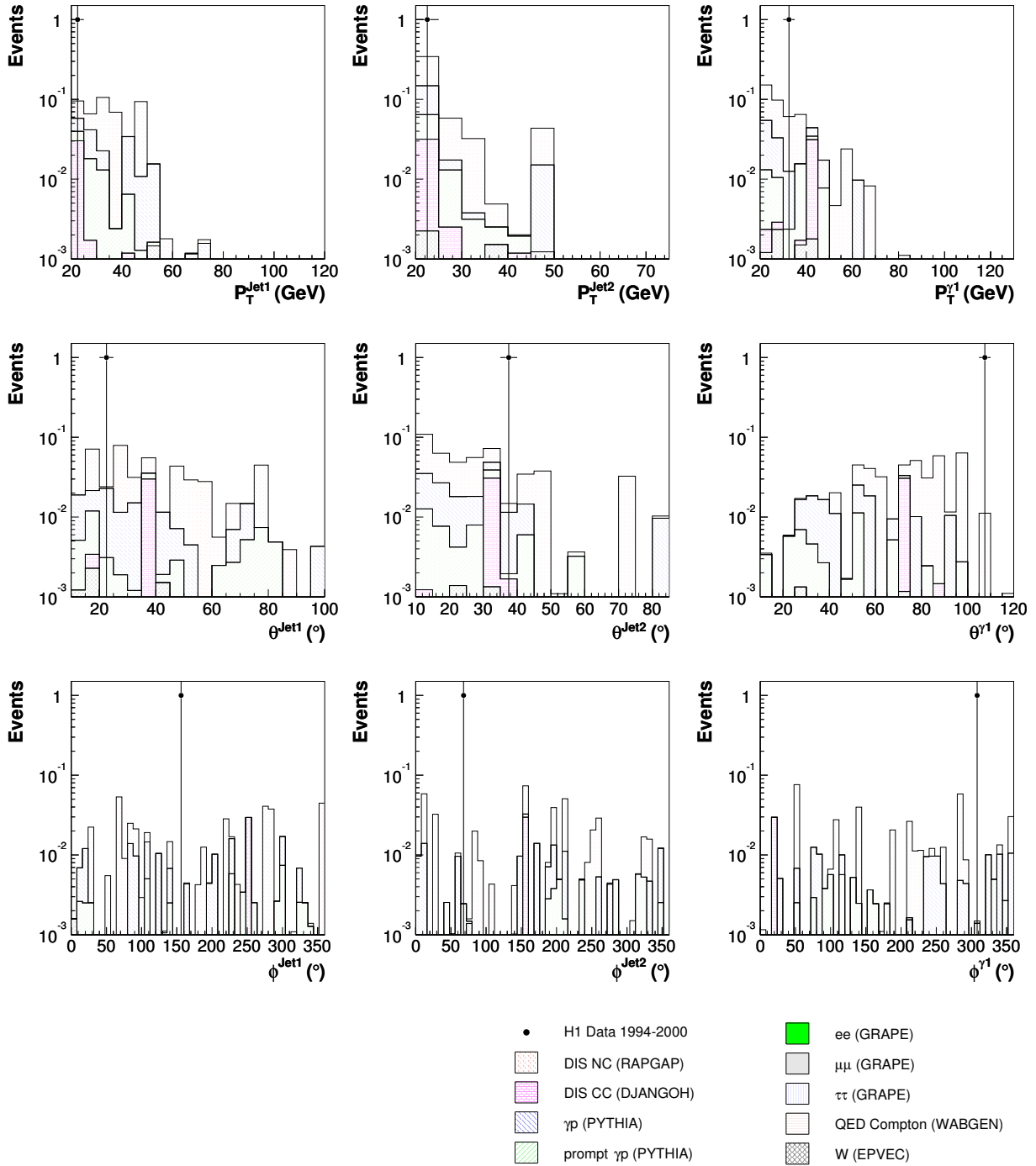
# $e-j-\nu$ event class



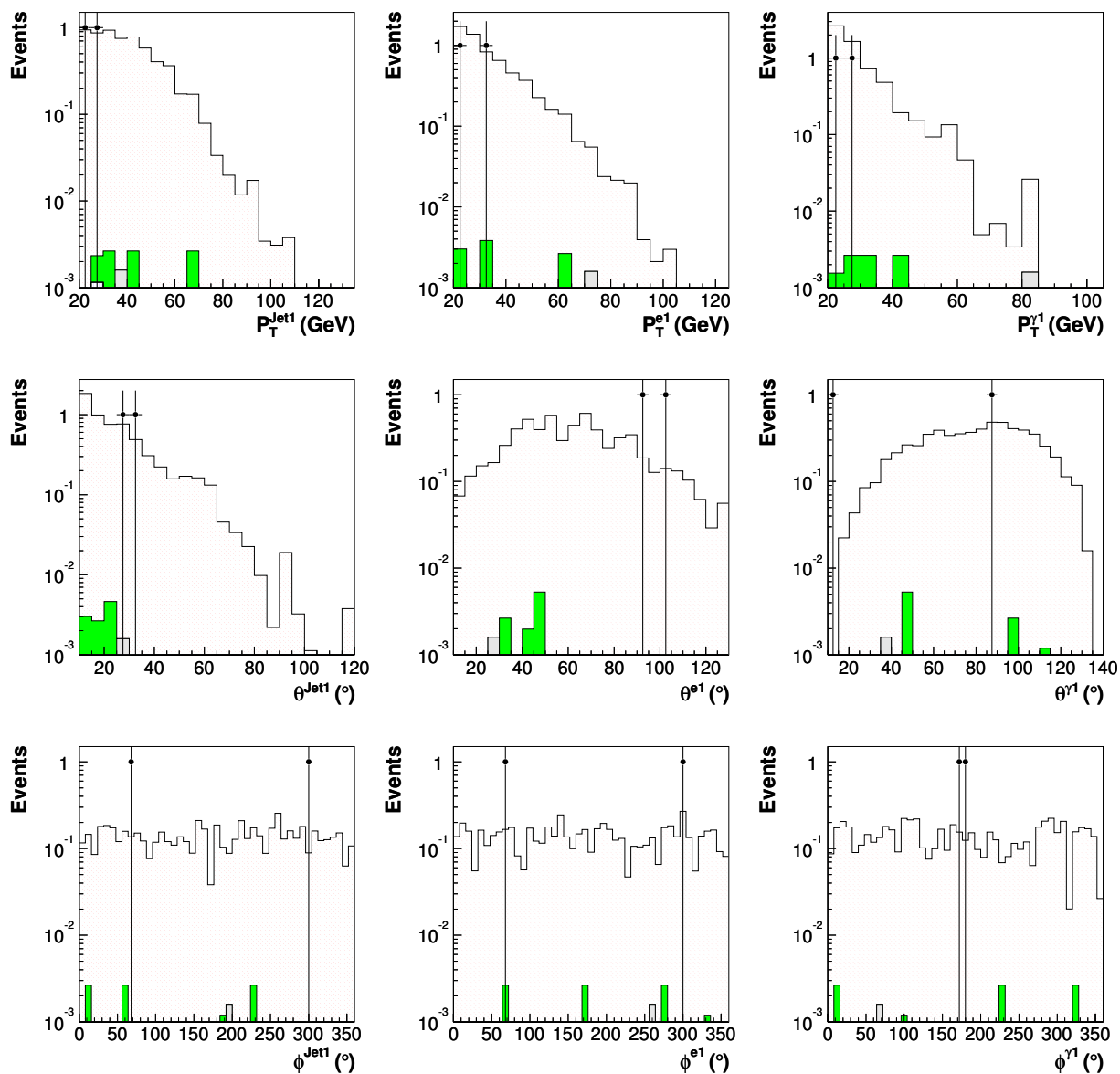
## $\mu$ - $j$ - $\nu$ event class



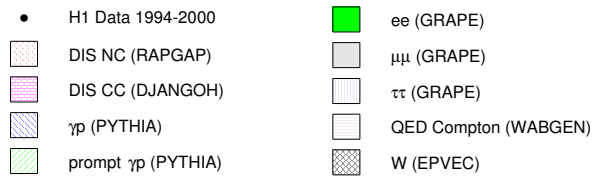
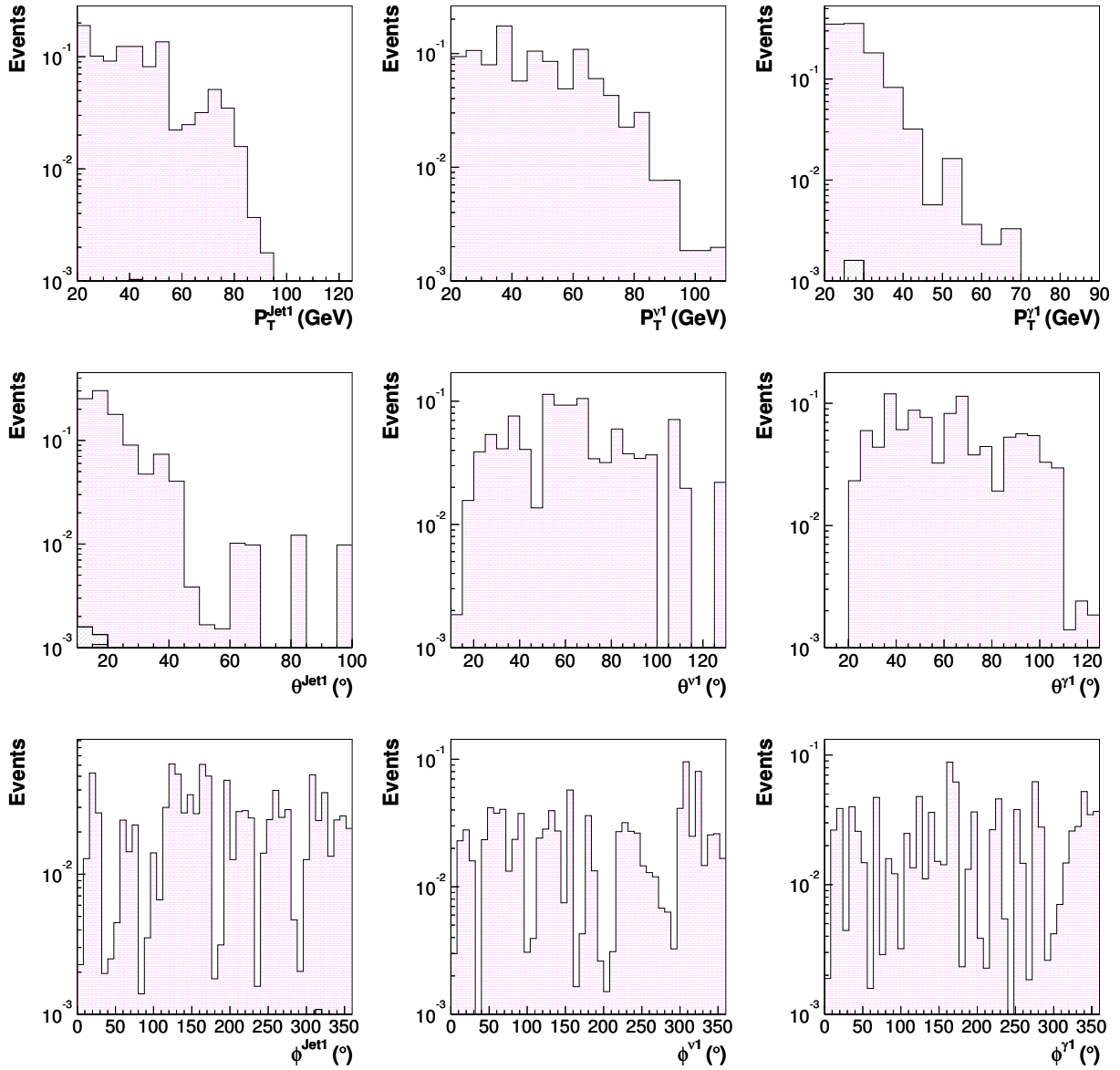
# $j-j-\gamma$ event class



# $e-j-\gamma$ event class

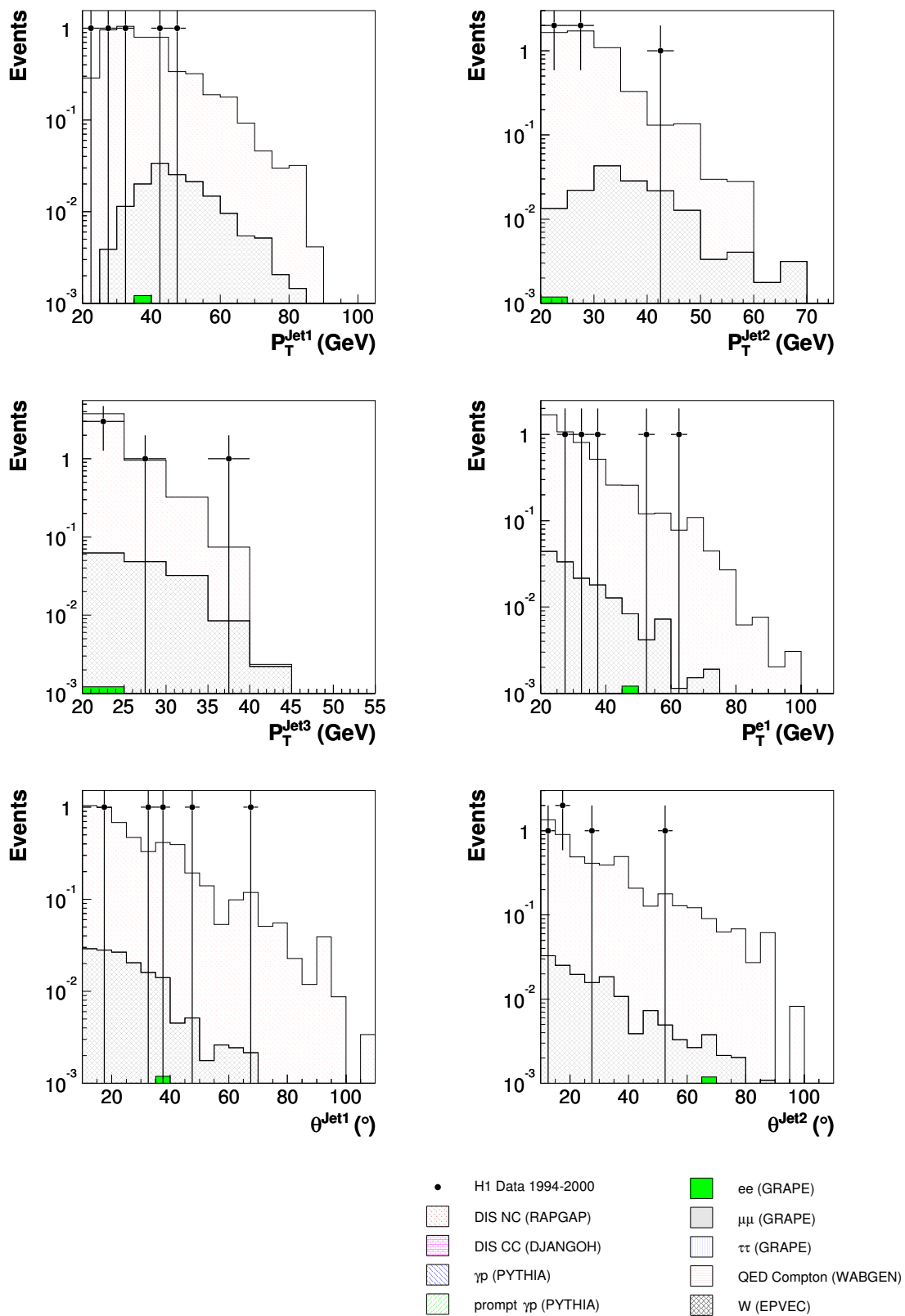


# $j$ - $\nu$ - $\gamma$ event class

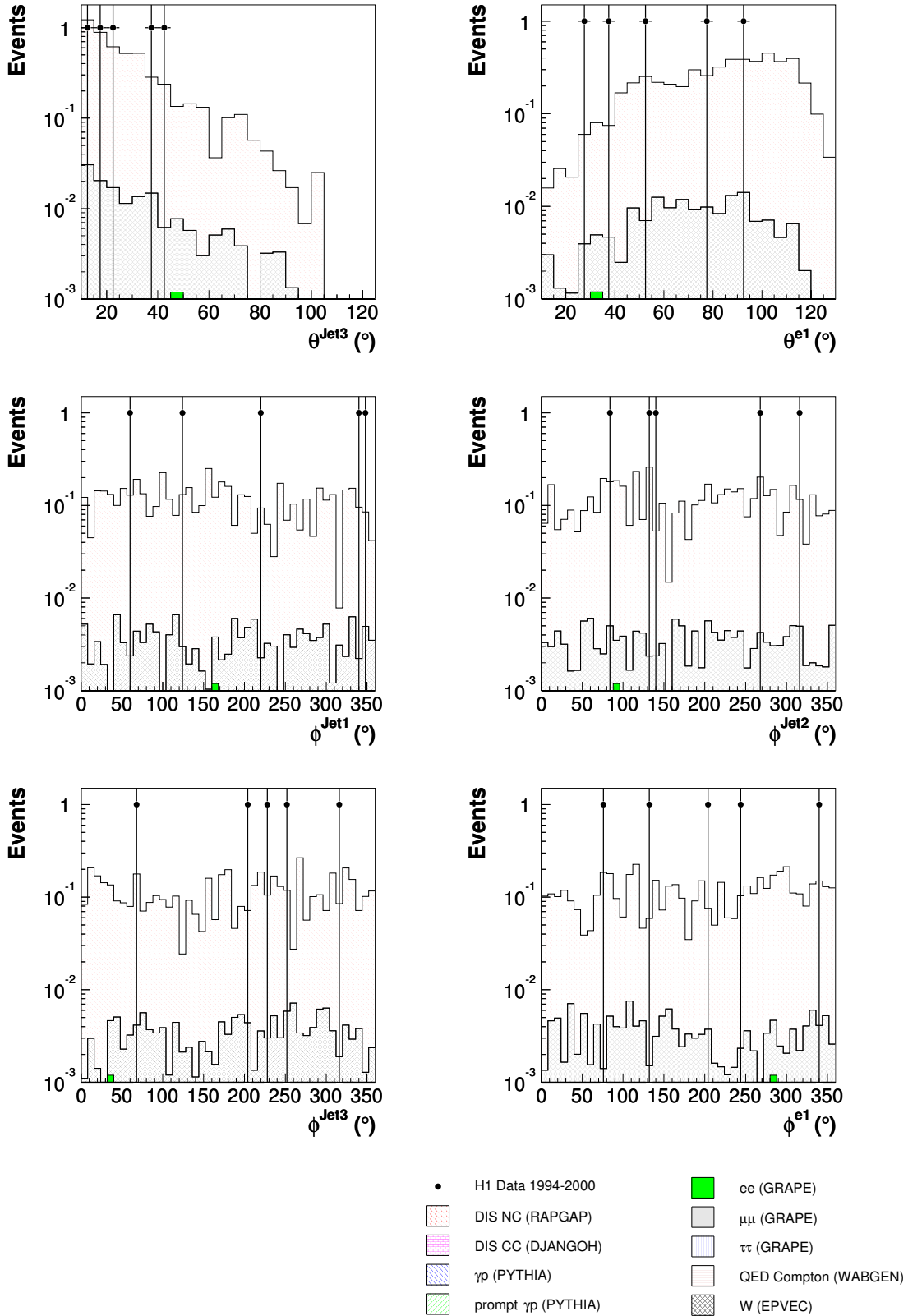




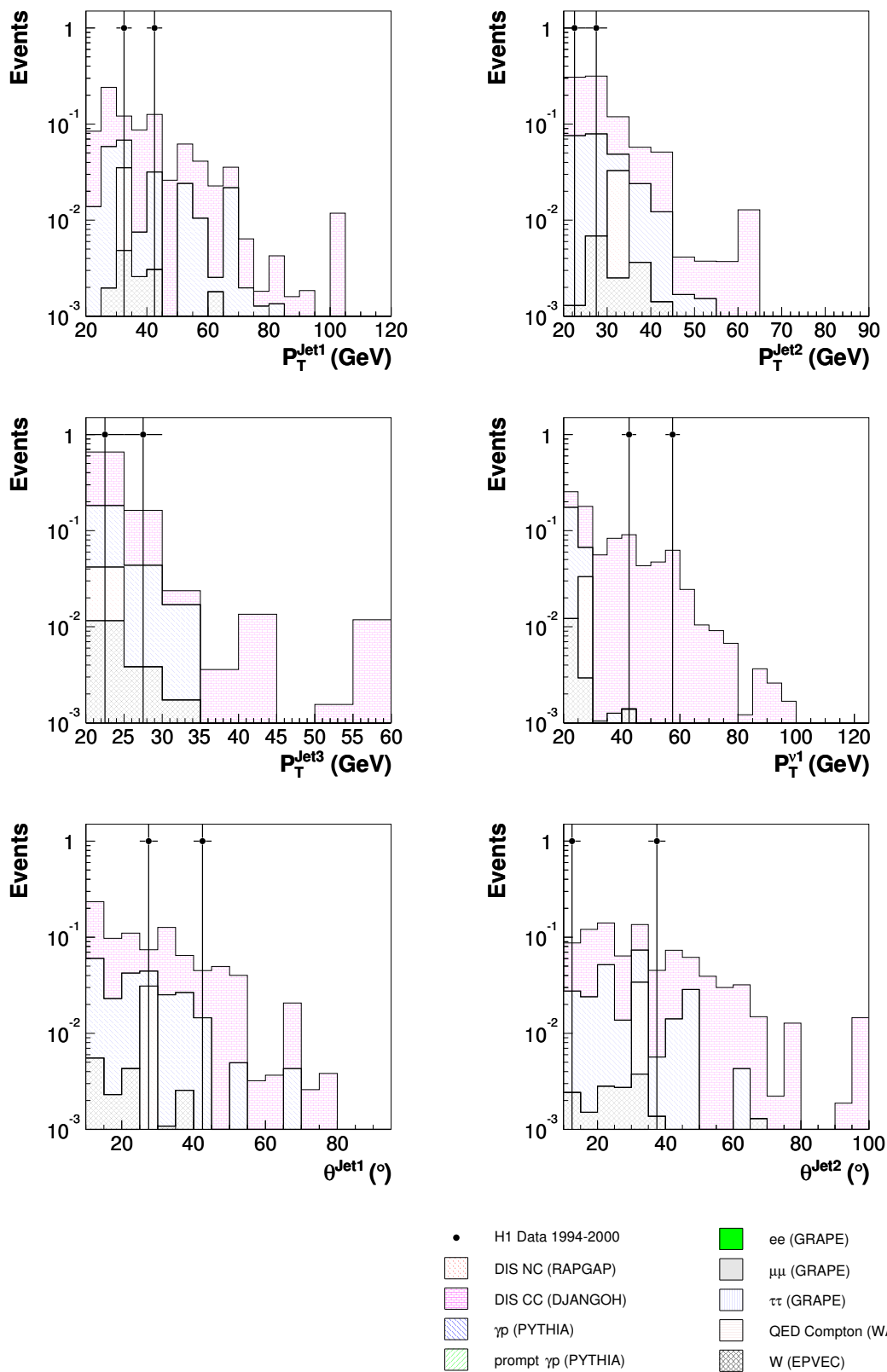
## $e-j-j-j$ event class



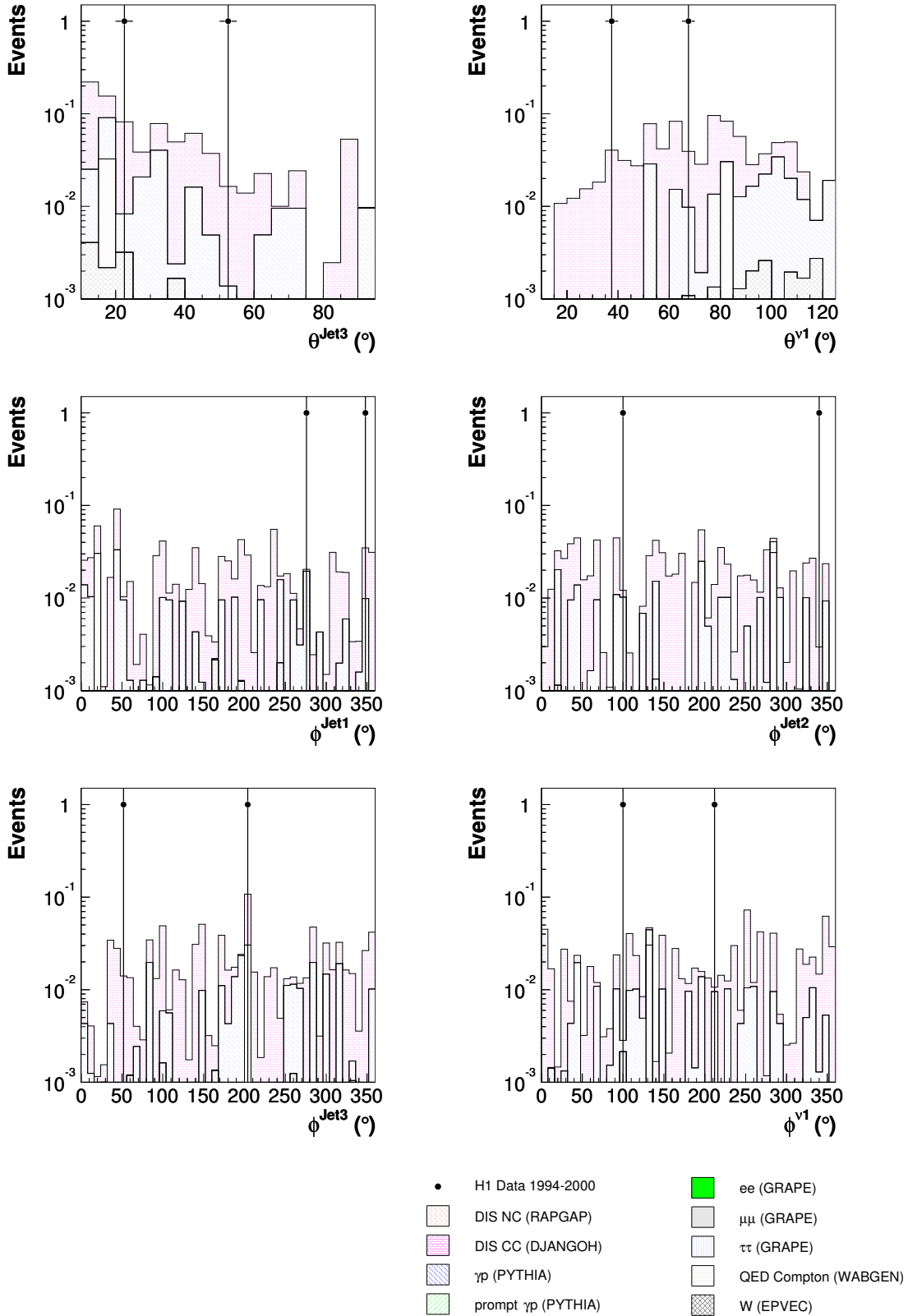
# $e-j-j-j$ event class



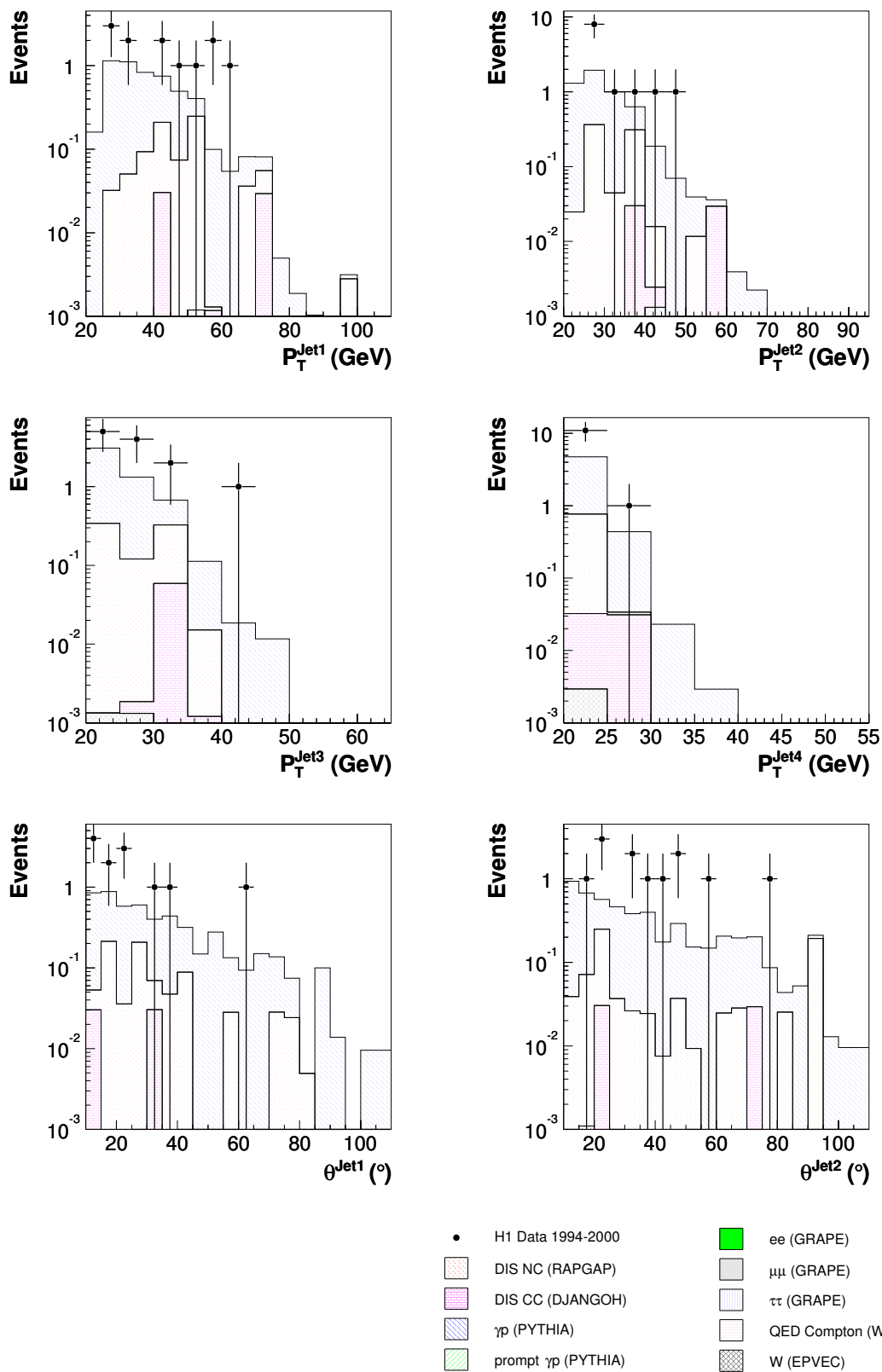
## $j-j-j-\nu$ event class



# $j-j-j-\nu$ event class



## $j-j-j-j$ event class



# $j-j-j-j$ event class

