GRC4F: A FOUR-FERMION EVENT GENERATOR FOR e^+e^- COLLISIONS

hep-ph/9605312, Comput.Phys.Commun.100:128-156,1997

- Tree level Helicity amplitudes produced by "GRACE": Feynman diagram automatic computation system (http://www-sc.kek.jp/minami/)
  - Fermion masses $\surd$
  - Full spin correlations $\surd$
- Unweighted events: BASES/SPRING for integration and event generation
- All 76 four-fermion final states (all diagrams included)
- Selection of "Generic" process: i.e. $e^+e^- \longrightarrow q\bar{q}q\bar{q}$
- ISR, FSR
  - Structure Functions (ISR)
  - QED Parton shower like (QEDPS) for s-channel diagrams (t-channel, in preparation, see Kurihara's talk)
- Beamstrahlung: "Circe" $\surd$, "Luminous" in progress
- Treatment of the W-width gauge violation: $L\mu\nu$ transform method: hep-ph/9412215, Phys.Lett B349 367-374,1995
- Interface to Pythia for parton shower and hadronisation
- Coulomb correction between intermediate W's $\surd$
- Gluon contribution (hadronic processes) $\surd$
- Anomalous couplings $\surd$

GRC4F: Cross-sections $(\times \mathbf{10^{-1}} \boldsymbol{Pb})$

Cuts	$\sqrt{s}(GeV)$			
	183	183 with ISR	190	190 with ISR
None	**7.975 ± 0.009**	**6.909 ± 0.009**	**8.438 ± 0.009**	**7.480 ± 0.010**
Hadron	**7.869 ± 0.008**	**6.807 ± 0.008**	**8.327 ± 0.009**	**7.376 ± 0.009**
Electron	**1.151 ± 0.001**	**1.035 ± 0.001**	**1.288 ± 0.001**	**1.161 ± 0.001**
Elec.+Hadr.	**1.044 ± 0.001**	**0.933 ± 0.001**	**1.179 ± 0.001**	**1.055 ± 0.001**
Elec.+ Hadr.,M=0	**1.065 ± 0.001**	**0.952 ± 0.001**	**1.200 ± 0.001**	**1.074 ± 0.001**

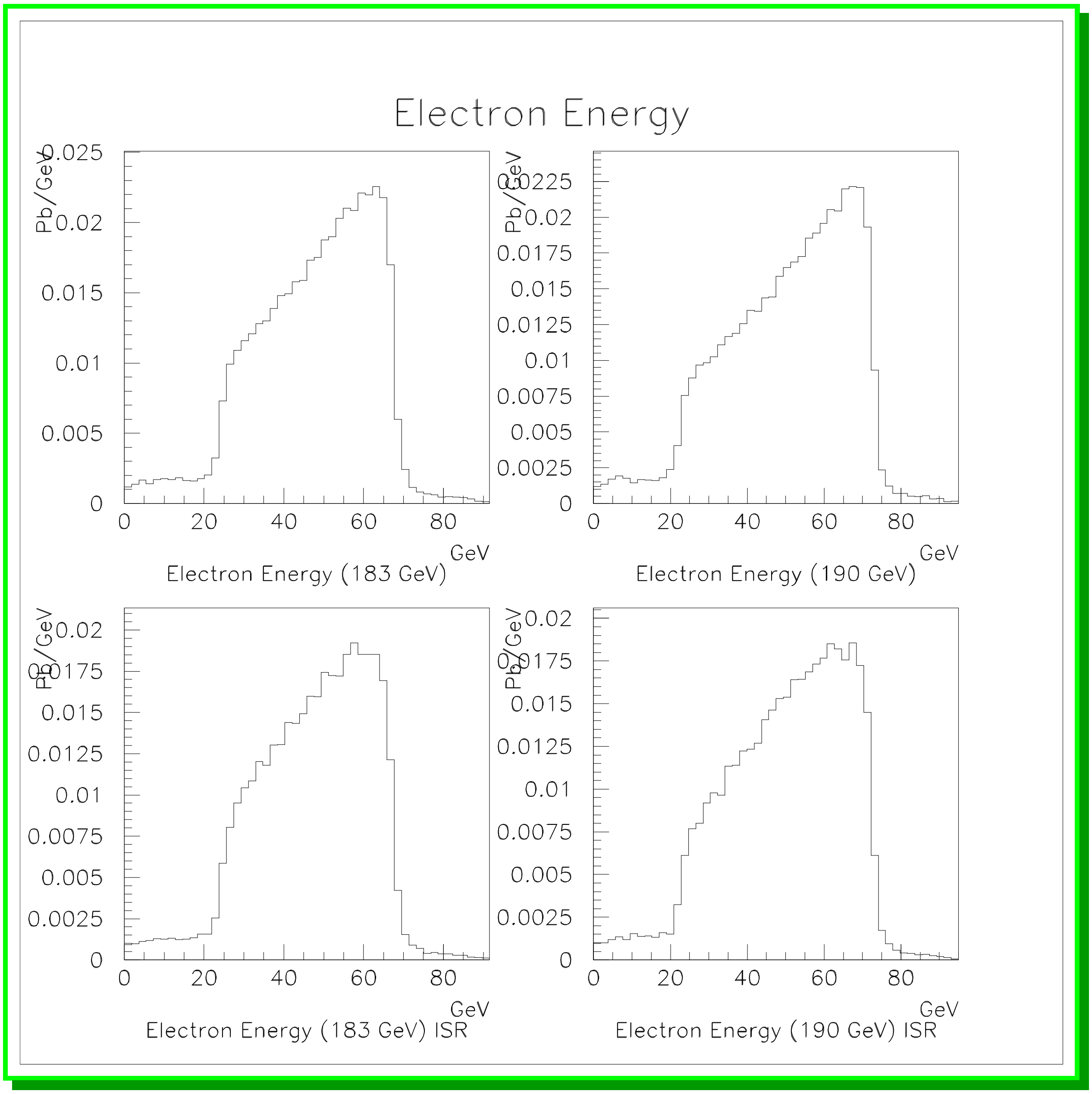

Figure 1: Only Hadronic cut

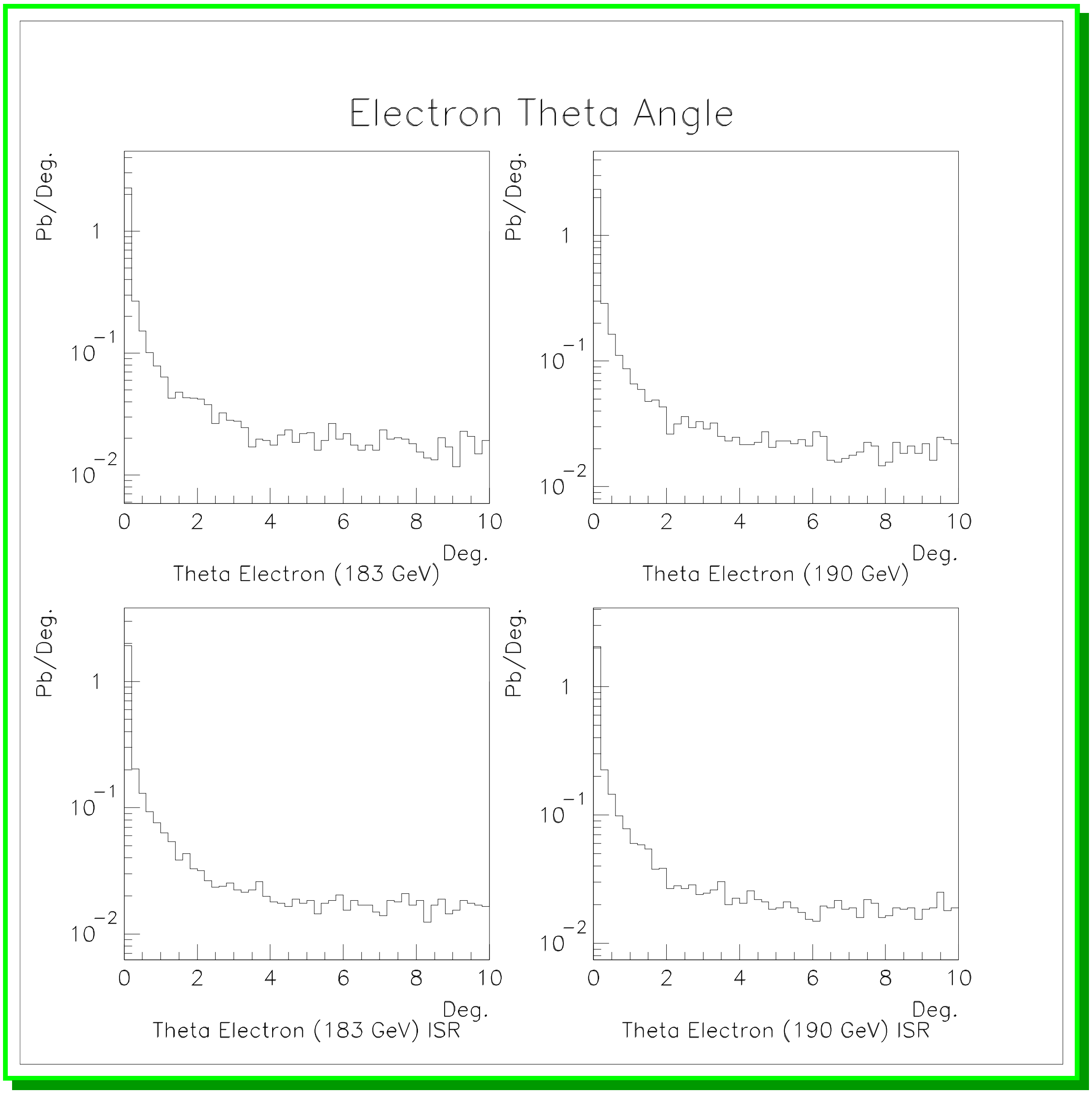

Figure 2: Only Hadronic cut

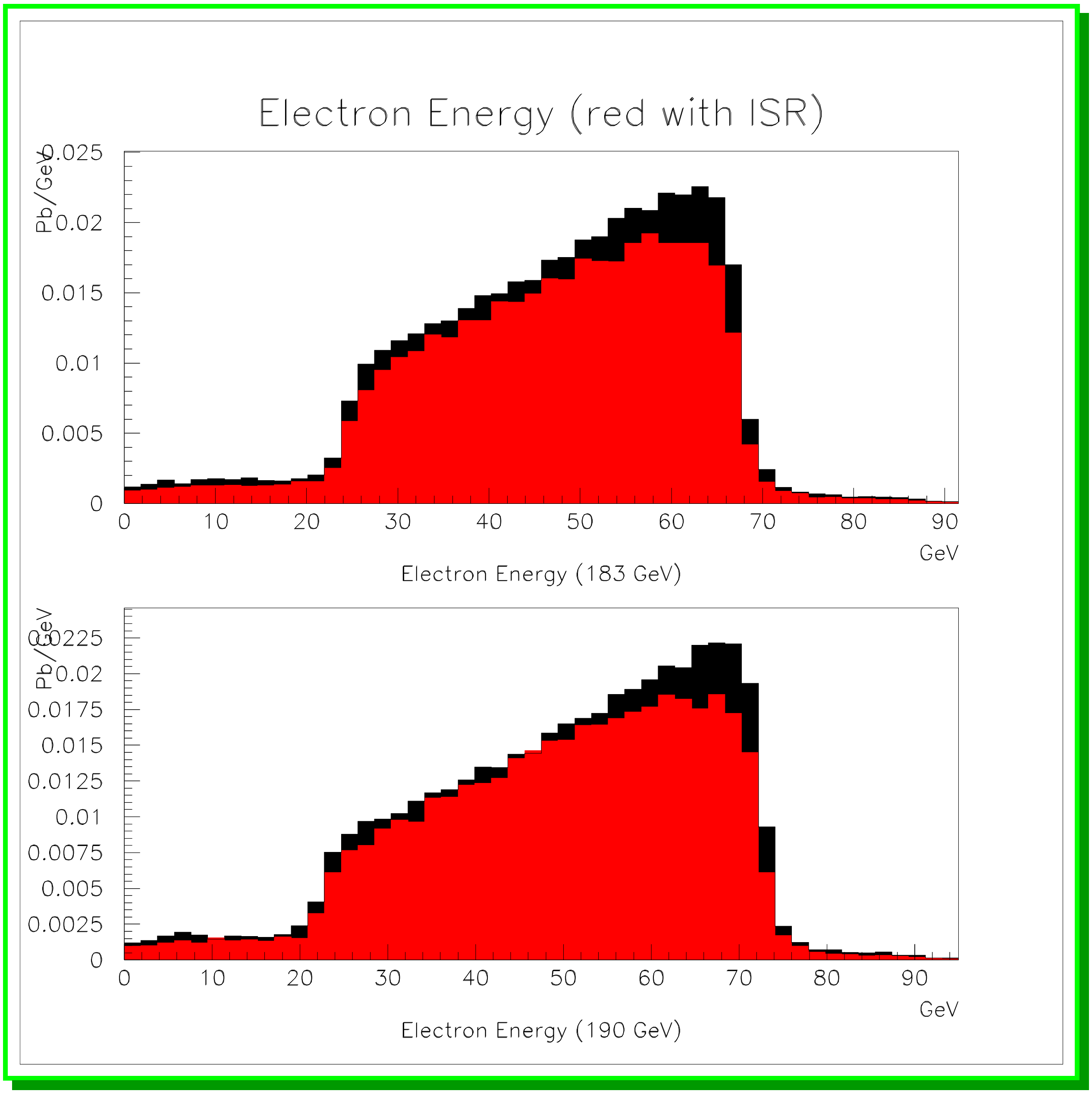

Figure 3: Only Hadronic cut

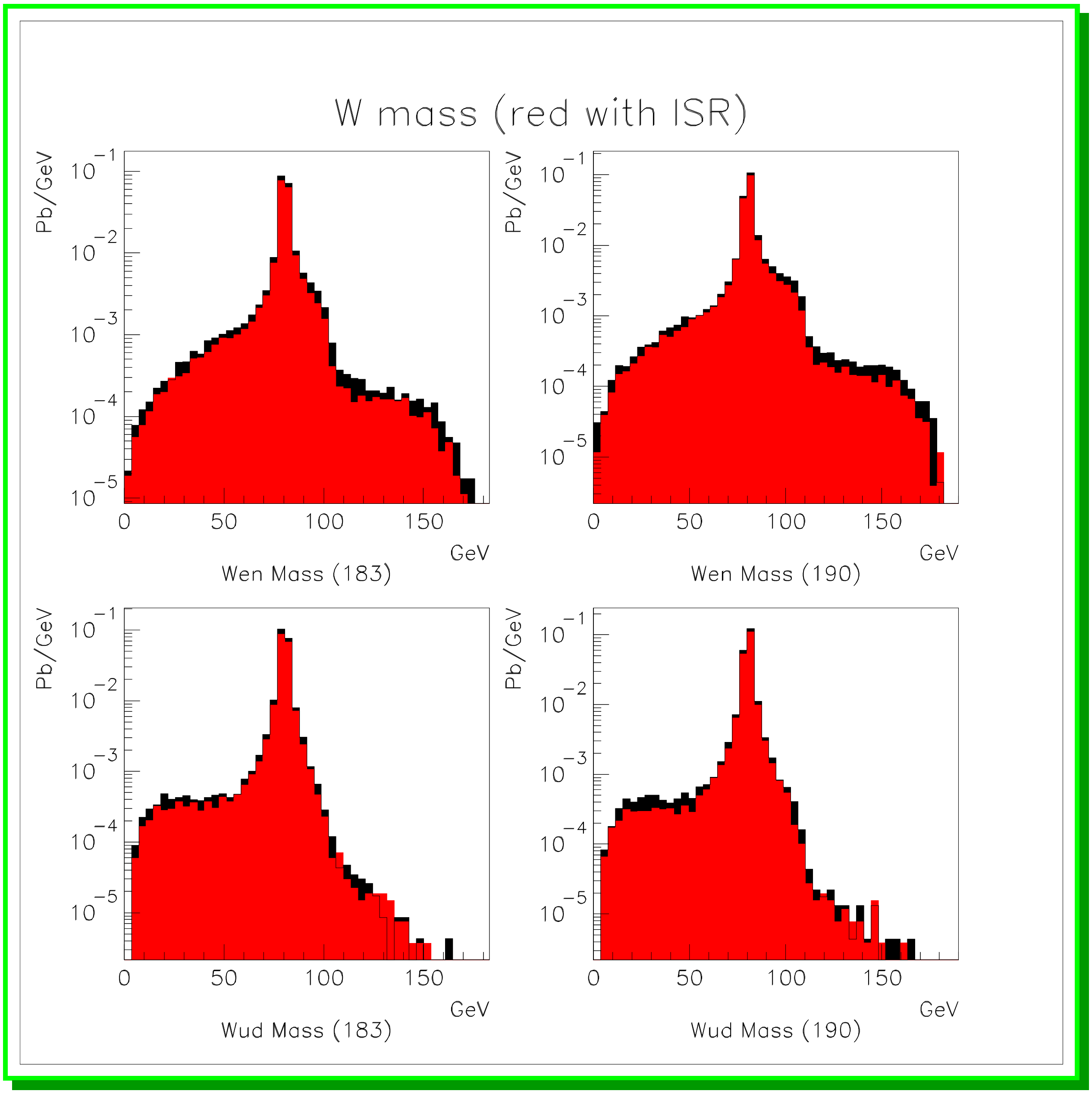

Figure 4: Only Hadronic cut

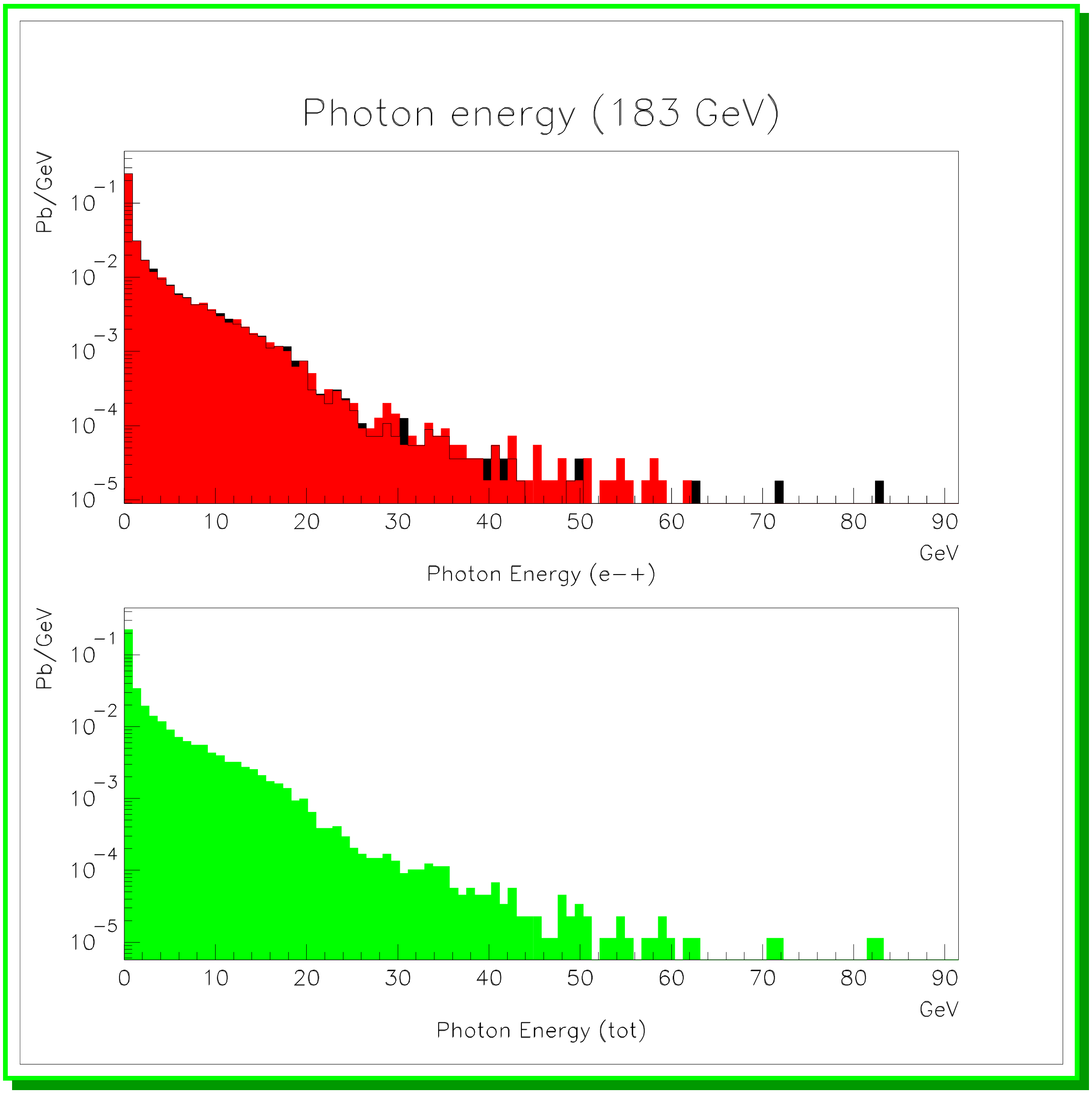

Figure 5: Only Hadronic cut

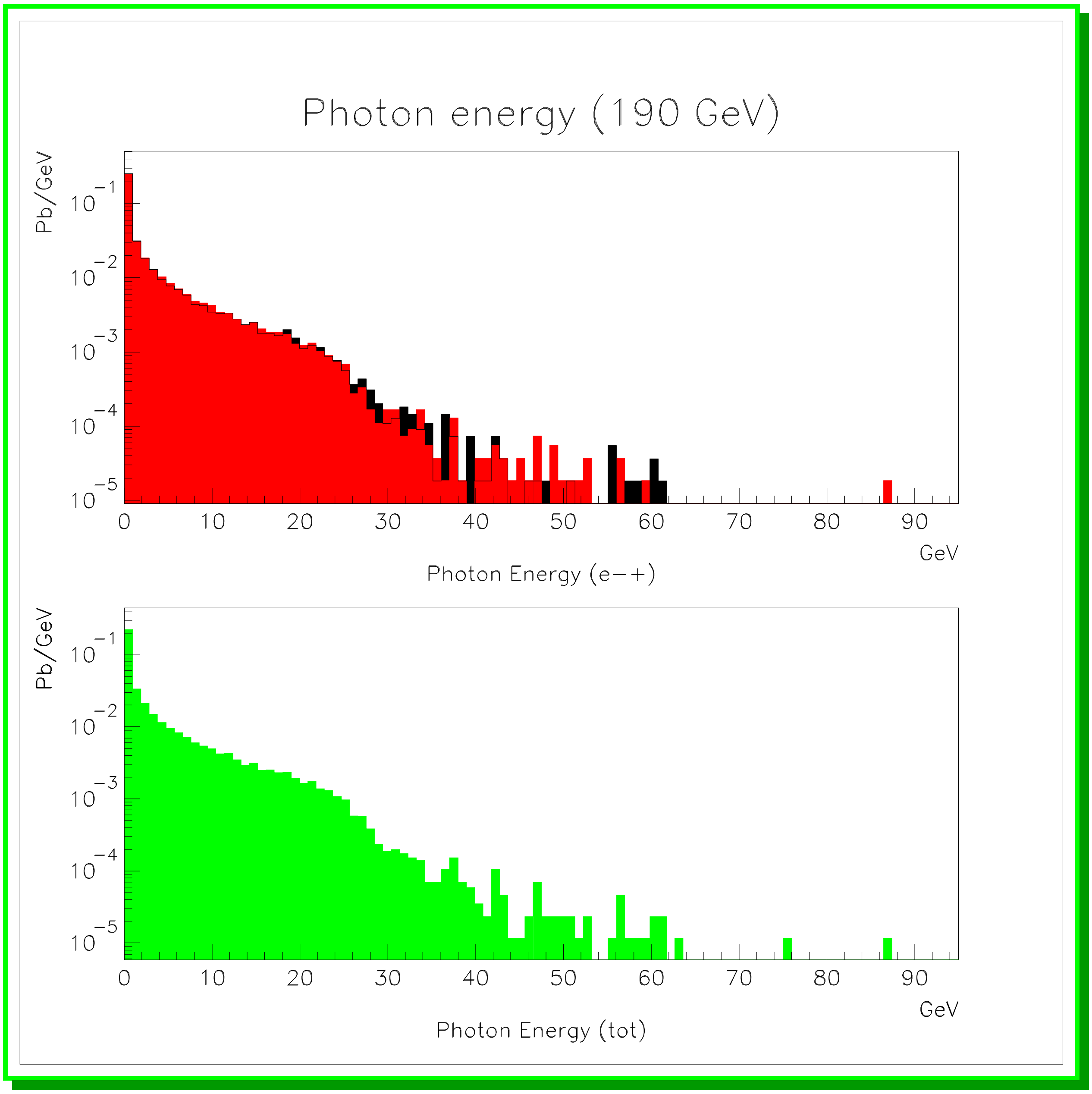

Figure 6: Only Hadronic cut

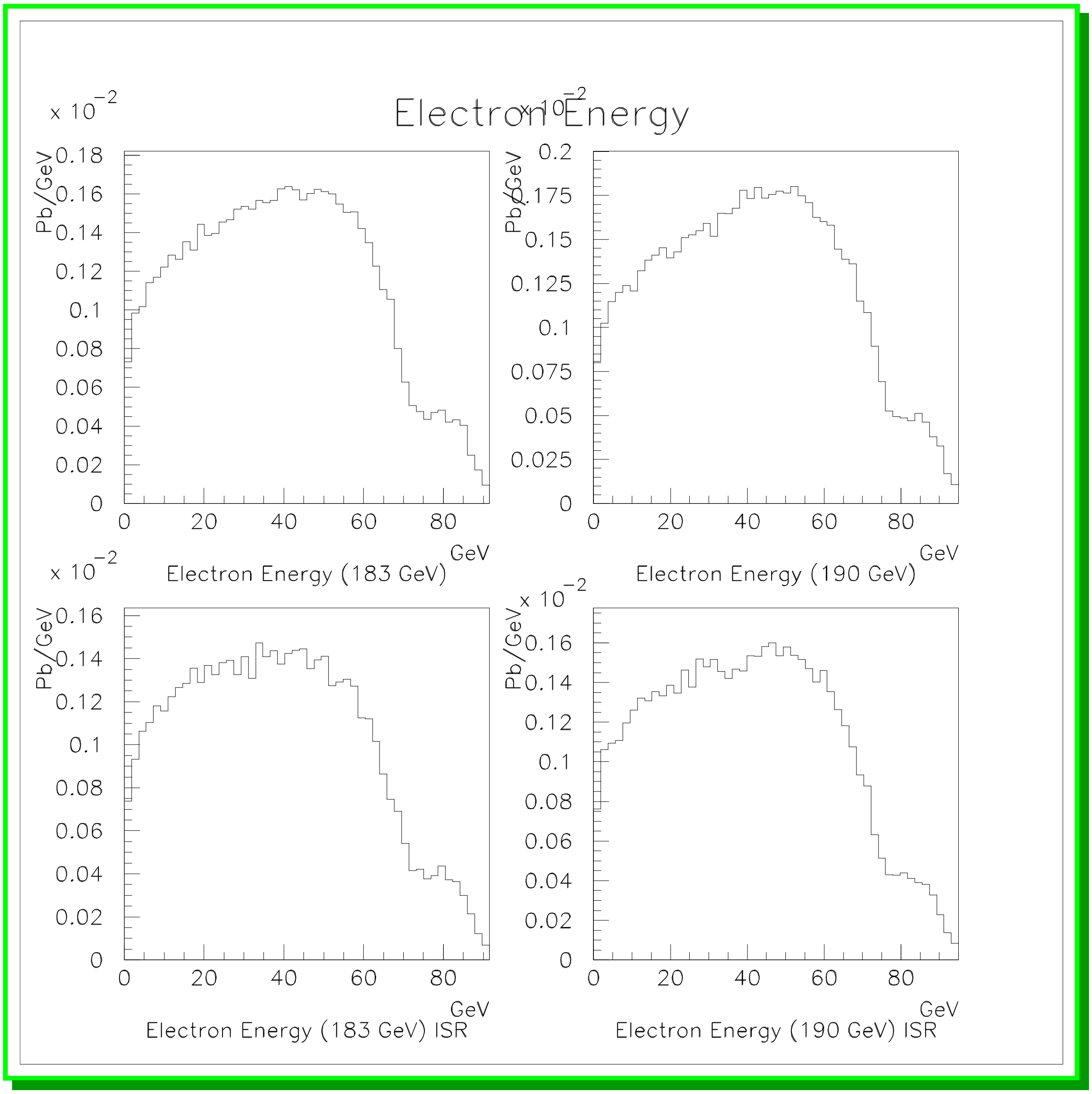

Figure 7: Hadronic and electron cut

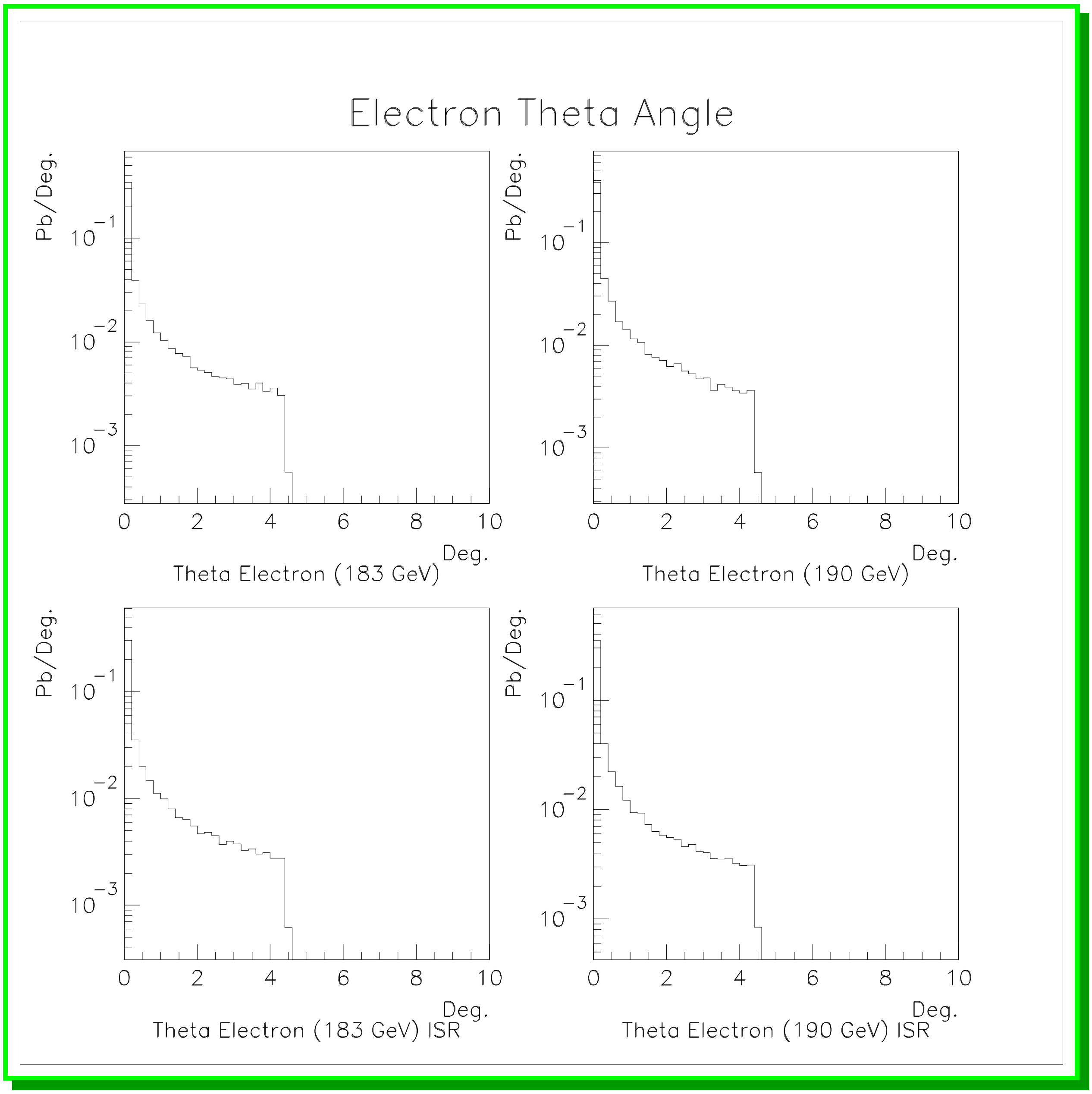

Figure 8: Hadronic and electron cut

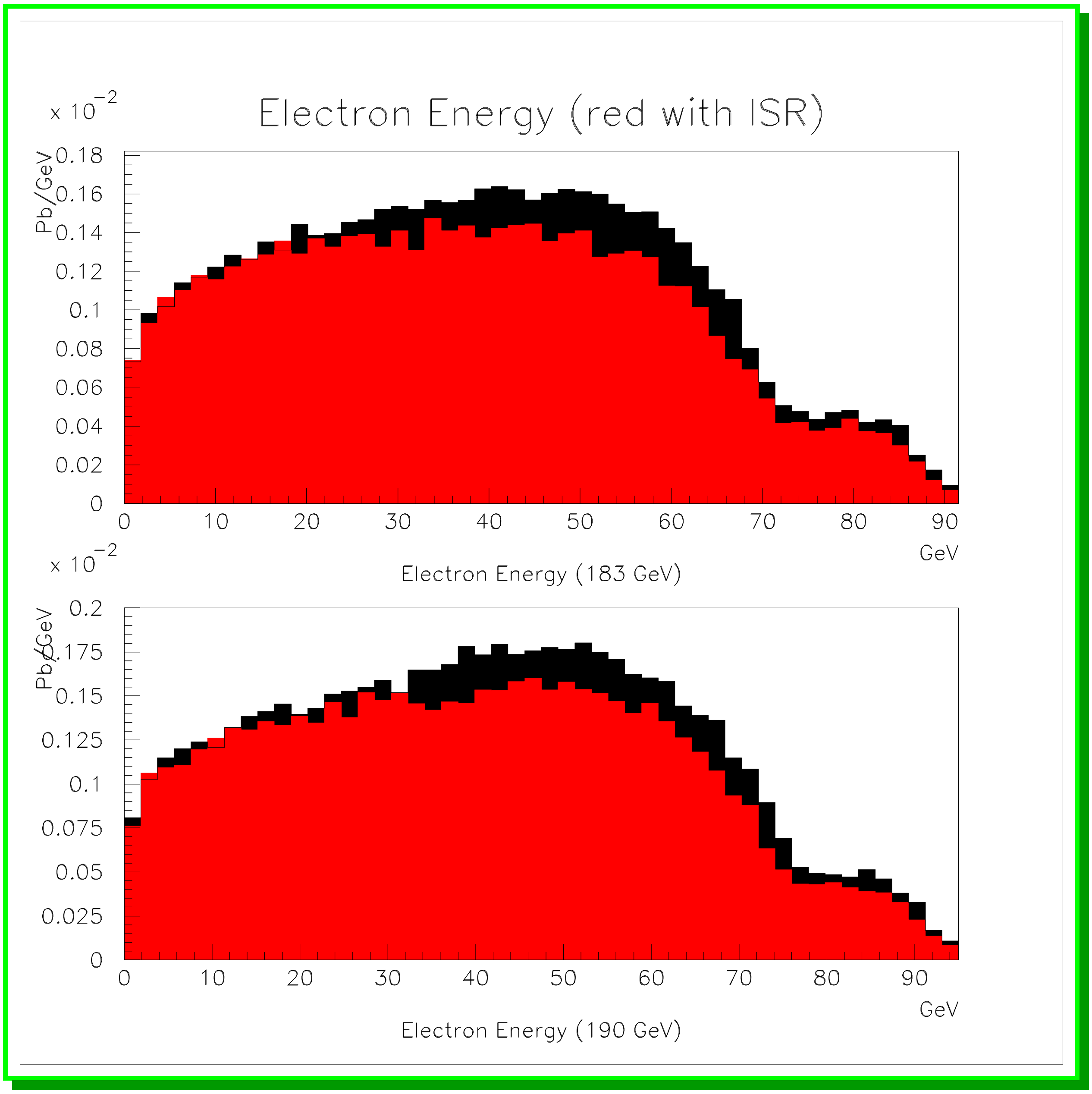

Figure 9: Hadronic and electron cut

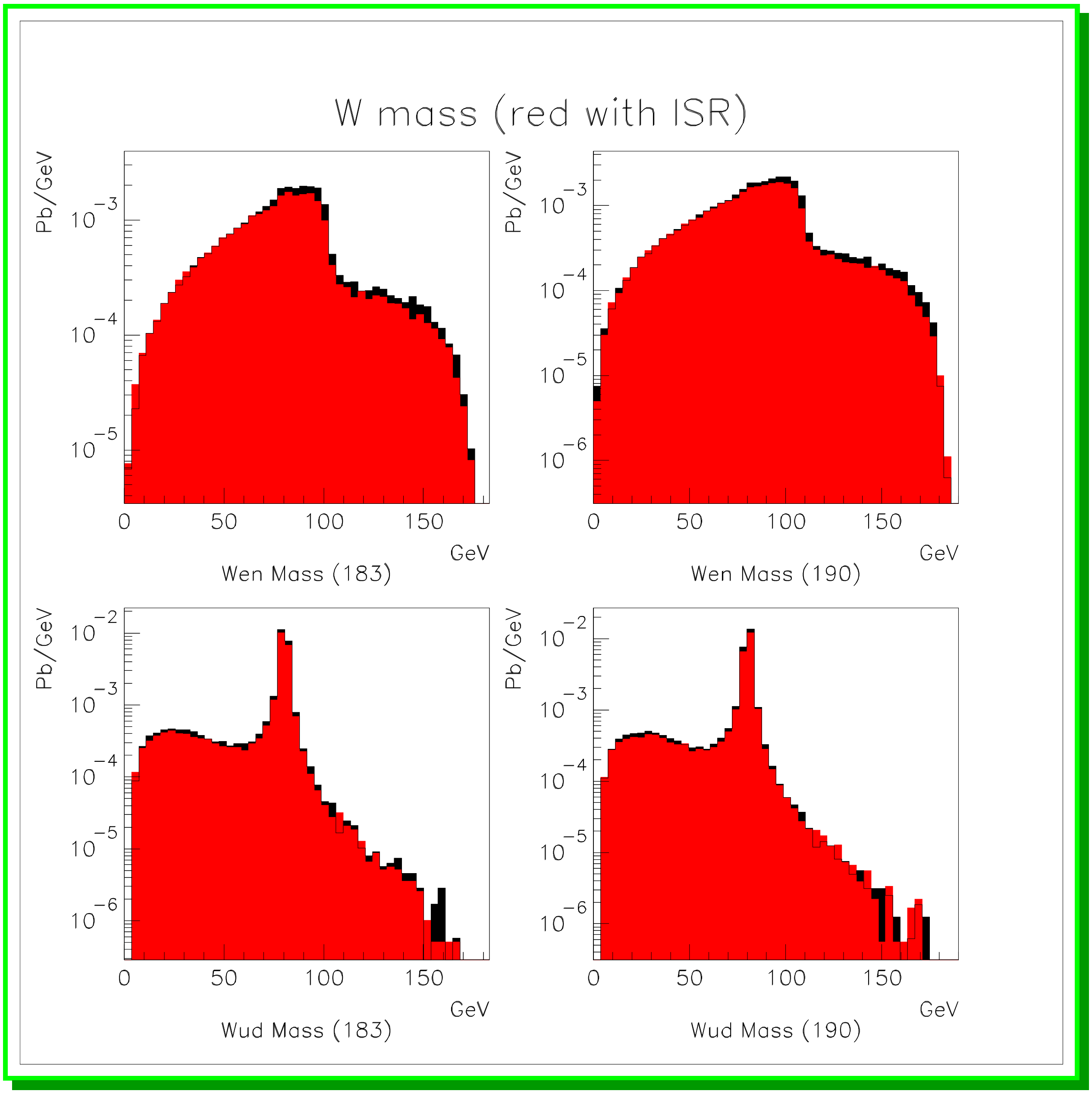

Figure 10: Hadronic and electron cut

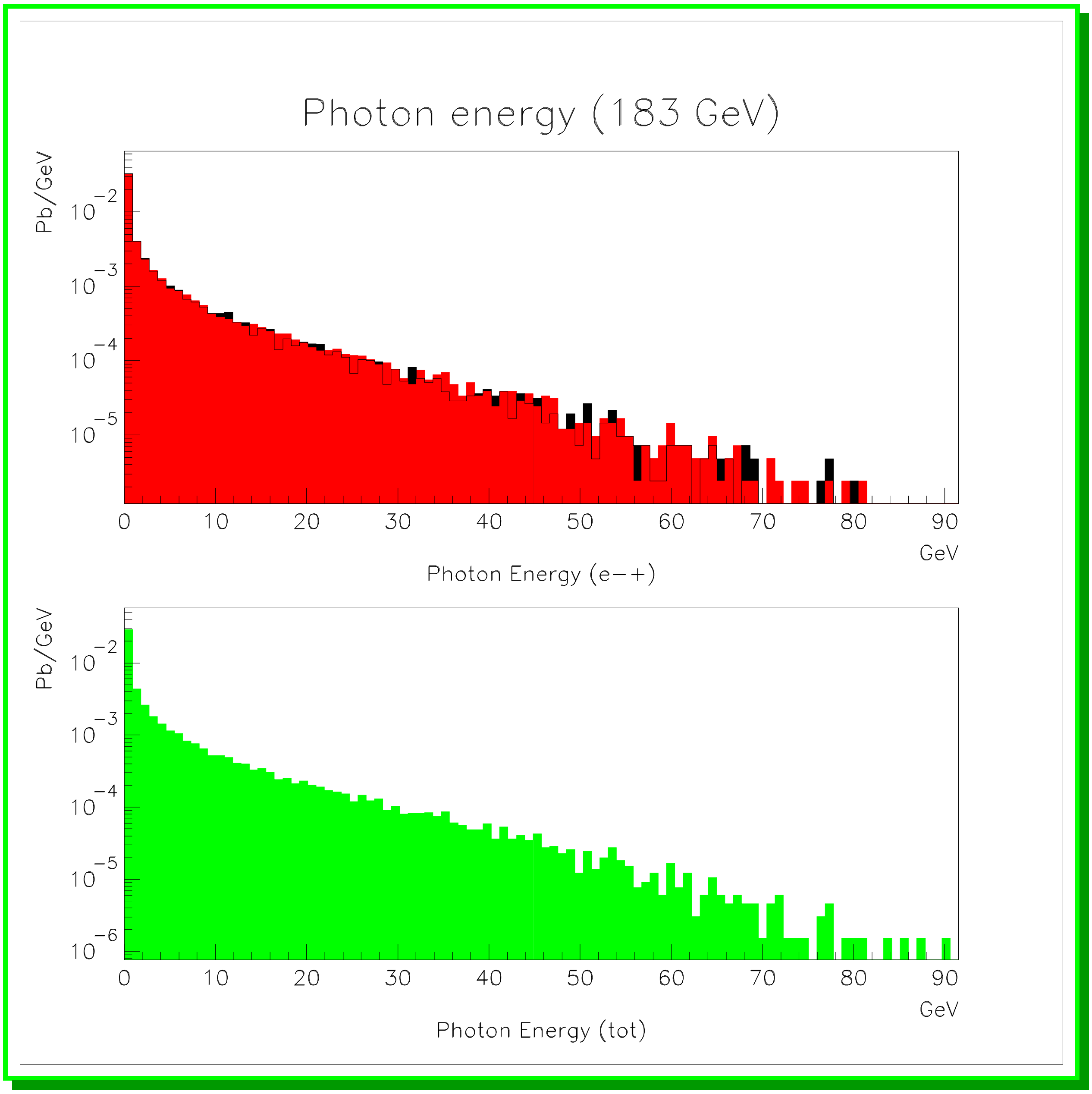

Figure 11: Hadronic and electron cut

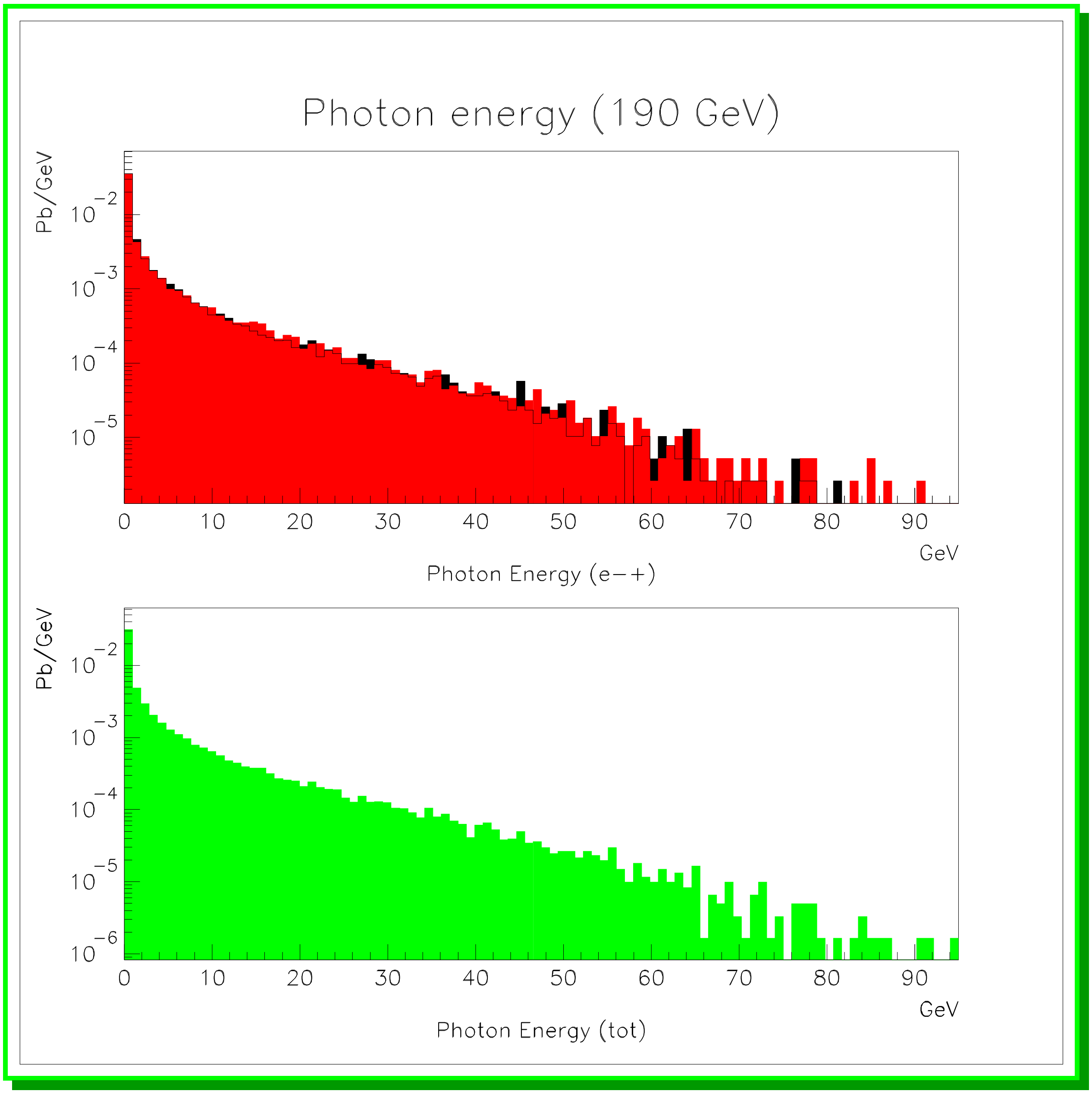

Figure 12: Hadronic and electron cut