

Delphes Studies on Angles of Acceptance

Nathan Wagner

May 30, 2023



- ① I ran exercises on various pre-generated Delphes studies
- ② In each output ROOT file, particles found by the detector were classified into four main categories: electrons, muons, jets, and photons
- ③ I studied the distribution of the polar angle θ from the beam axis for each category of particles
- ④ Cards provided for simulations only accepted leptons and photons with pseudorapidity up to $|\eta| < 2.5$ corresponding to an acceptance angle of $\theta > 0.164$ rad

The following are results from e^+e^- processes

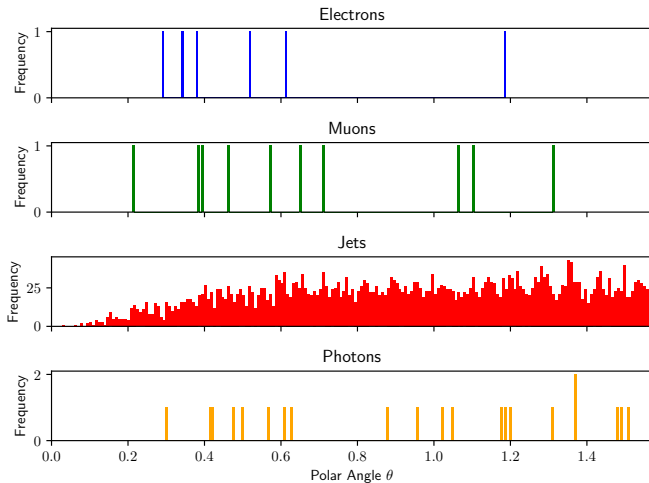


Figure: Process: $e^+e^- \rightarrow q\bar{q}q\bar{q}$, $E = 1500\text{GeV}$, $N_{events} = 1,000$

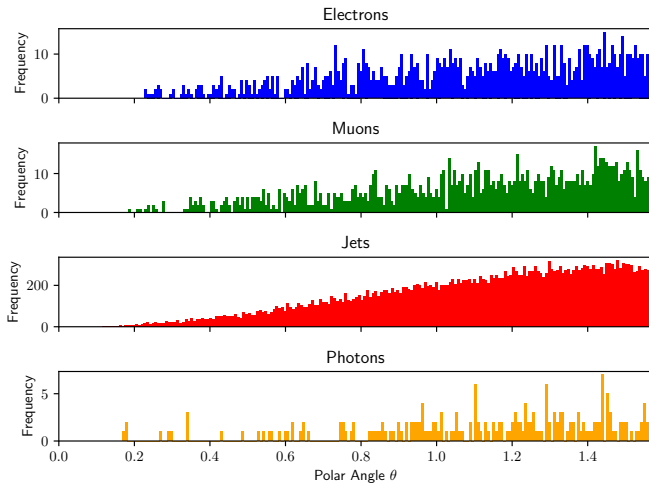


Figure: Process: $e^+e^- \rightarrow Z^0 H$, $E = 275\text{GeV}$, $N_{events} = 10,000$

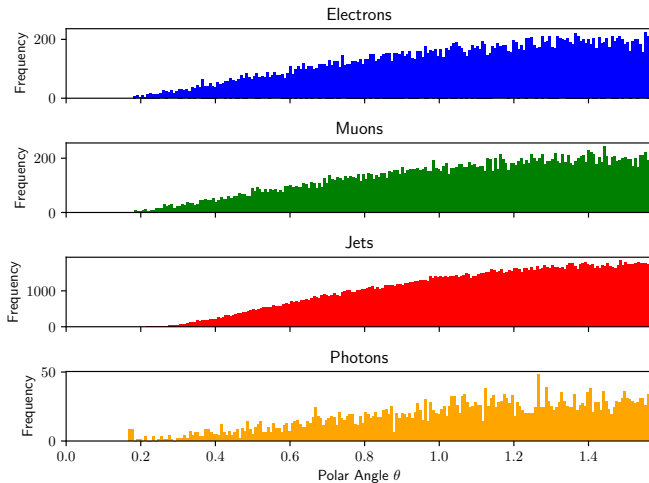


Figure: Process: $e^+e^- \rightarrow Z^0 H, H \rightarrow \tau^+\tau^-$, $E = 125\text{GeV}$, $N_{events} = 100,000$

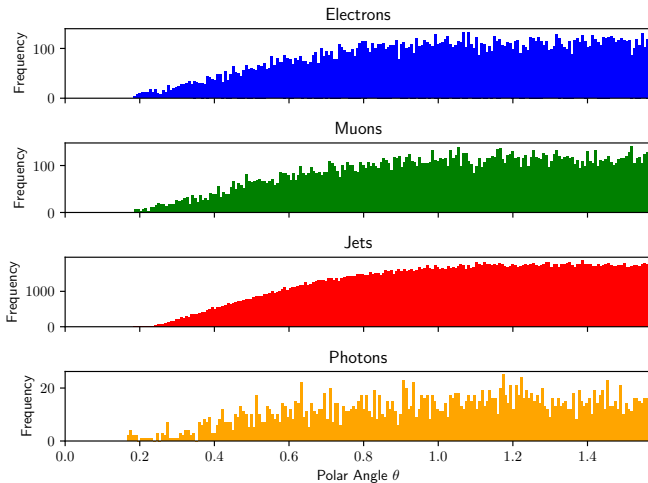


Figure: Process: $e^+e^- \rightarrow q\bar{q}Z^0, Z^0 \rightarrow \tau^+\tau^-$, $E = 125\text{GeV}$, $N_{events} = 100,000$

The following are results from pp processes.

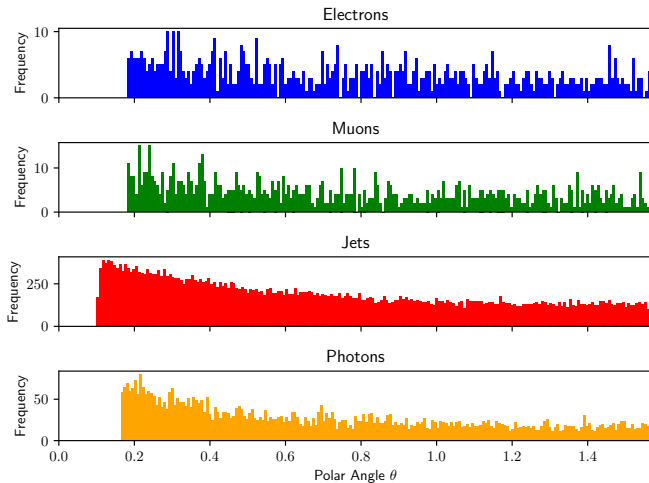


Figure: Process: $pp \rightarrow W^+ a j j$, $E = 6750\text{GeV}$, $N_{events} = 10,000$

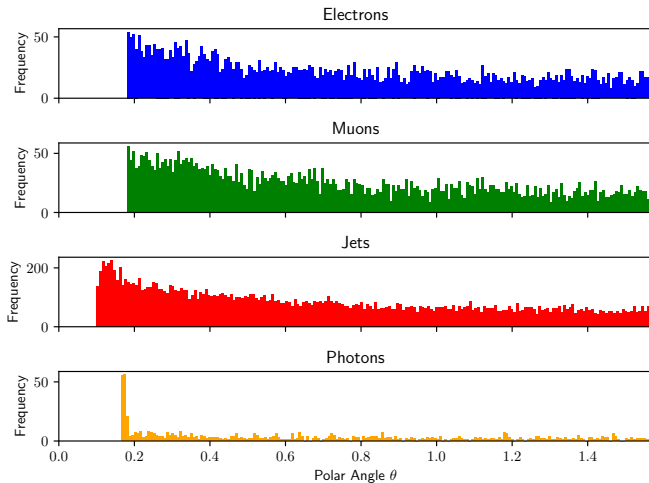


Figure: Process: $pp \rightarrow W^+W^+W^-W^+$, $E = 6500\text{GeV}$, $N_{events} = 10,000$