

Electrons

- Electron fakes do give significant background for WW...
 - Electron fake rate much higher than that for muons
 - Its not hopeless, some improvement could make the background small enough
- Electron energy measurement much worse than that for muons
 - Don't know how much improvement is possible.
 - But I see things I don't like in the way things are done now.
- The electron algorithms had not been done very well before we started working on them.

Electrons Radiate down to $1/e$ of their energy in $1 X_0$

16 27. *Passage of particles through matter*

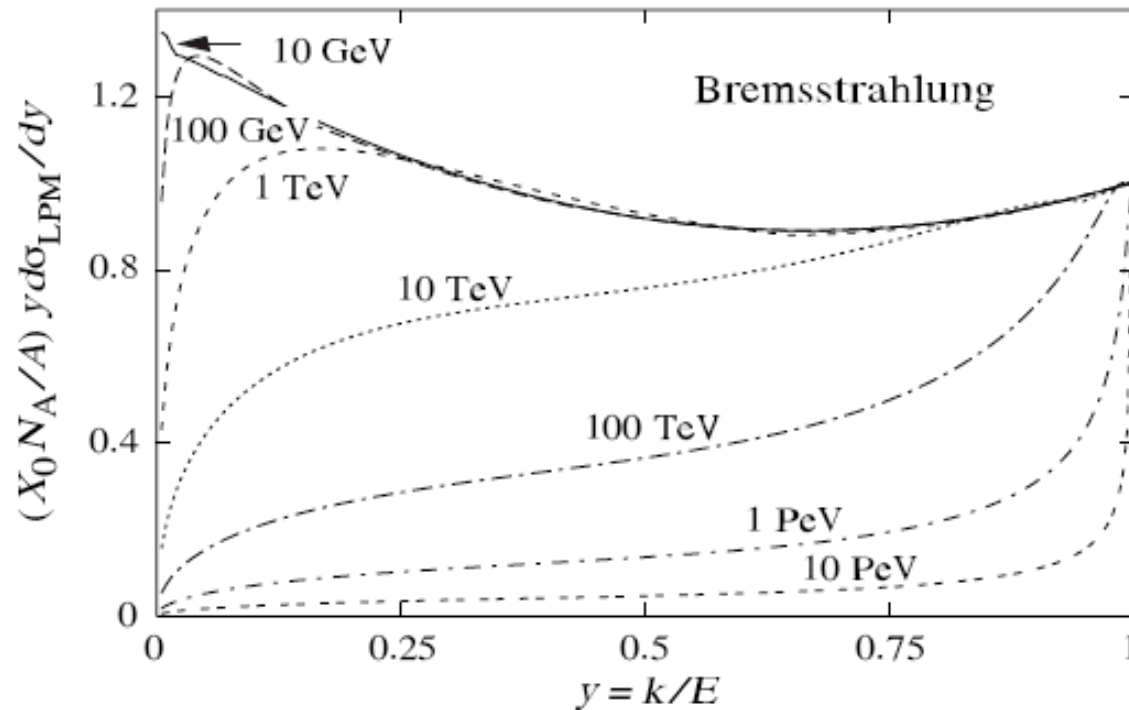
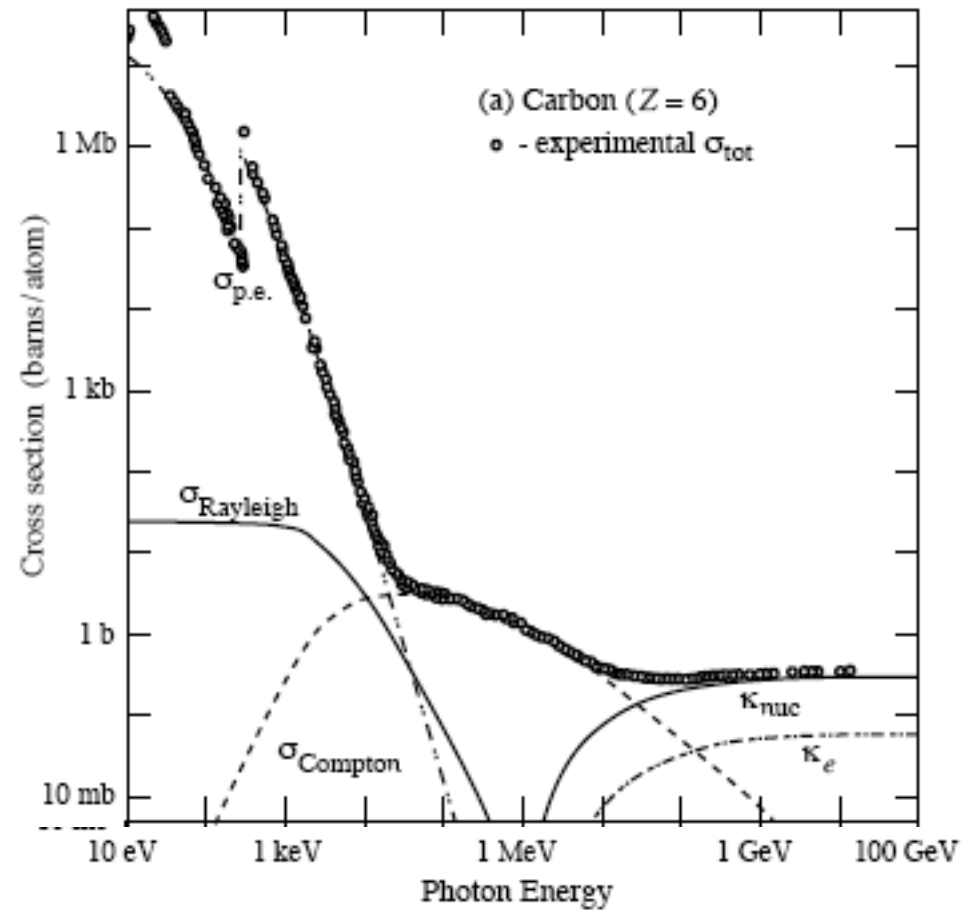


Figure 27.11: The normalized bremsstrahlung cross section $k d\sigma_{LPM}/dk$ in lead versus the fractional photon energy $y = k/E$. The vertical axis has units of photons per radiation length.

Some of these photons Interact



Our Work on Electrons

- Electron ID (Talk given)
 - Substantial improvement over old CMS e-id
 - Better efficiency and lower background, fewer cuts, remove Pout, more robust
 - Put in CMSSW after presentation in Sept. CMS week
 - Adopted by Egamma
 - Update from Matteo
- New “sequence” for GSF electrons
 - Uses standard CMS combinatorial track seeder
 - Gives higher efficiency in endcap than “pixel match” since it automatically uses more layers for seed.
 - Recent work started to use this in HLT

More on Electrons

- More ideas on e-id
 - Avi and Johannes
 - Tracker hits (speculative but maybe powerful)
- Isolation
 - Matt is doing this
 - Need to reduce e-fake-rate by some combination of id and isolation
- Energy measurement
 - Basic SuperCluster Energy corrections
 - Better combination of SC and Track