Thoughts on Sar*t*re ePb

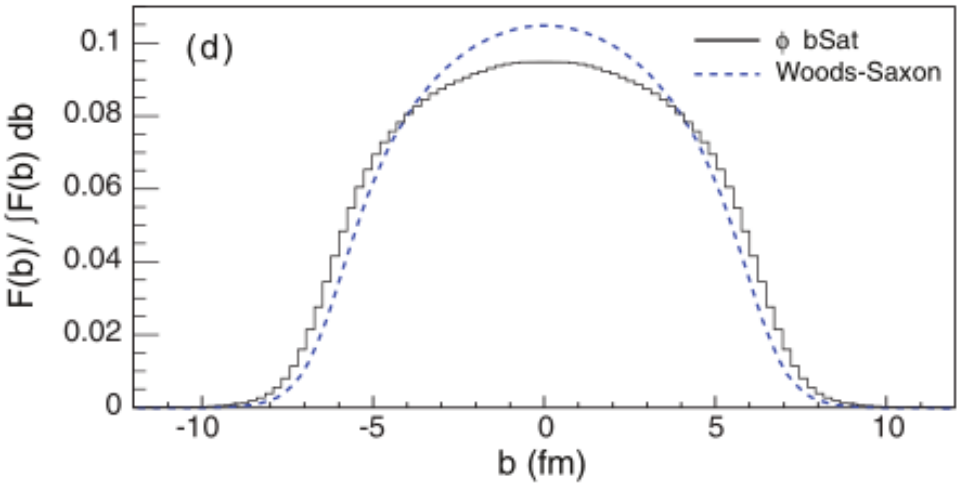
MDB

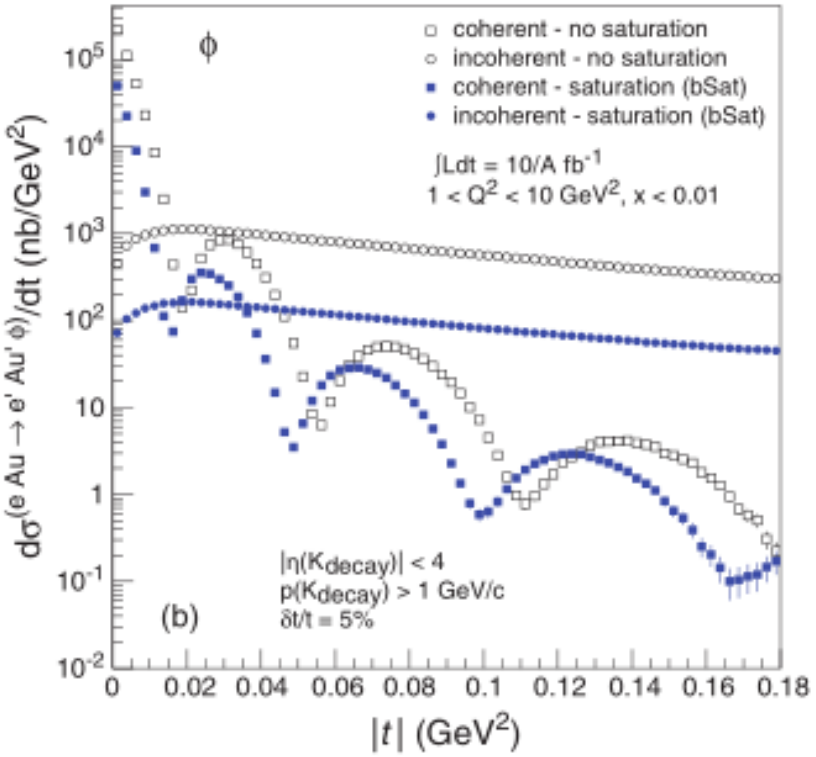
Current ePb tables are useless
But I have an idea...
(following up on what Tobias said last meeting)

Current ePb tables are for LHC (UltraPeripheral)

- Lowest W^2 bin ~ 2 or 10 GeV^2 has $d\sigma/dt=0$ for most values of Q^2,t.
- 2nd lowest W^2 bin is at ~2,000,000 GeV^2 !
- Gap is 100x the whole range of the eAu tables which cover 2 or 10 to 20000 GeV^2
- To far to interpolate reasonably

Coherent dσ/dt is $|FT|^2$





Plots from Toll, Ullrich, PRC 87, 024913 (2013)

Problem: Small changes in R cause a scale change in dσ/dt
Ratio ePb/eAu may be quite a bit off.

An idea

- Tobias suggested using the assumption that $d\sigma/dt$ (Pb) ≈ $d\sigma/dt$ (Au) since the Pb radius is only 3.8% larger than Au.
- What about the next approximation?
  $d\sigma/dt^*$ (Pb) ≈ $d\sigma/dt^*$ (Au)
  where $t^* \equiv tR^2$ is dimensionless
  - Should work for coherent
  - Not sure about incoherent, but we can check how that scales...

Relatively easy to confirm

- Generate a coherent ePb grid which is somewhat sparse in Q^2xW^2 (3x4 or even to start 1x1!) but similar to eAu in # of t bins (say 160).
- Compare $d\sigma/dt$*
- If it works, repeat for total (incoherent). 1X1x20, or 3x4x20. (note: typical eAu is 2 regions, each with ~20x55x20)
- If it works reasonably well, we can make a simple transformation on the EXISTING eAu grids to generate a reasonable approximation to ePb very quickly.