BeAGLE update

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Excitation Energy in BeAGLE

- E* = M(residual nucleus) - M_{gs}(residual nucleus)
  - If it is negative, ABORT and reroll the event.
    - Usually only a few %. May be biased (low W e.g.)
    - Installed a feature to allow me to test for bias.
  - Otherwise, hand to FLUKA/PEANUT for nuclear evaporation/breakup etc. (inside of DPMJET).
  - If it is large (e.g. E* 17 GeV rather than the typical 40 MeV due to absorbing PyQM recoil), then FLUKA/PEANUT goes into an infinite loop.

Nuclear recoil absorption now works

- $E^* = M(\text{residual nucleus}) - M_{gs}(\text{residual nucleus})$
  - If $E^* > E^*_{max} = 3$ GeV (tuneable), then set $E^* = E^*_{max}$
  - Good news: fixes infinite loop
    - Note: similar thing done (0.5 GeV) in Sartre which uses CASCADE instead of FLUKA/PEANUT
  - Bad news: Breaks energy conservation for that event unless we come up with a kludge to fix it.
  - We can experiment with raising E^*_{max}, but this will allows us to have a first look at whether this breaks agreement with E665 neutrons for nonzero qhat.

Plans

- Test the new code a bit (still in private area)
- Release ~ mid-next week & document
- Work on Fermi momentum
- When updated PyQM with working iEg=1 is available:
  - Default is they will be fragmented
  - Add option to absorb recoil gluon(s) on individual nucleons instead, kicking the nucleon out.

Requests/Questions for PyQM

- Are all up-to-date features in?
- Add heavy quark tables.
- Fix iEg=1 so that it correctly returns 1 gluon per quenched parton (i.e. only if there is a nonzero radiation).
  - Location of gluon should probably be downstream of original hard interaction.
  - Should we allow the gluon to also quench?