$^6\text{Li}$

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Procedure

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2. Add entry w/ 0 value ahead of Spill: approx. 1 s
**Procedure** (cont’d)

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4. Ion Chamber 2 (raw). Divided by 1000.
Procedure (cont’d)

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2. Add entry w/ 0 value ahead of Spill: approx. 1 s
3. Integrate *per* Spill. And divide by 4. \(\rightarrow\) \(\Sigma\)iMon
4. Ion Chamber 2 (raw). Divided by 1000.
5. Normalise.
No Li period = 05/08/[11H30,18H]

- See Caroline’s Weekly Report, page 5 @ WM of 05/11.

DC00U iMon in DCS DB
No Li period (cont’d)

- DC00U iMon now seen from ROOT

DC00Up iMon - NoLi [05/08-11H32, 05/08-19H59]
No Li period \((cont’d)\)

- Histo DC00U iMon \(\Sigma_i\mathrm{Mon}\) and Normalised

\begin{itemize}
  \item Widely spread values, wider than visual impression from Trend Plot
    \Rightarrow Integral (\(\Sigma_i\mathrm{Mon}\)) may not the best estimator
  \item Not much narrower when normalising
\end{itemize}

(Note: Histogram shown here is slightly outdated...)
Initial, w/ Li, period

- DC00U iMon in Initial period, w/ one Li foil.

(Note: At low intensity, [6H00, 7H50], current is produced more efficiently...

... contrary to indication from NoLi @ ~12H45.)
Initial vs. NoLi period

- Histo DC00U iMon $\Sigma iMon$ and Normalised ($\Sigma iMon$ and Normalised)

\[ \text{Entries} \quad 601 \quad \text{Mean} \quad 70.67 \quad \text{Std Dev} \quad 6.036 \quad \text{Overflow} \quad 0 \]

\[ \text{Entries} \quad 601 \quad \text{Mean} \quad 67.92 \quad \text{Std Dev} \quad 5.431 \quad \text{Overflow} \quad 0 \]

\[ \text{Entries} \quad 290 \quad \text{Mean} \quad 63.91 \quad \text{Std Dev} \quad 4.728 \quad \text{Overflow} \quad 0 \]

\[ \text{Entries} \quad 290 \quad \text{Mean} \quad 64.82 \quad \text{Std Dev} \quad 4.685 \quad \text{Overflow} \quad 0 \]

⇒ A 5% effect.
Results

- All 4 config’s: Ini (=one Li), PE, Li12, All (=Li×2+PE) vs. NoLi, in MPs and DCs.

\[ \text{Ratio } \sum \text{iMon } / \text{Ion2} \]

\[ \text{Ratio Ini/NoLi} \]

\[ \text{Ratio PE/NoLi} \]

\[ \text{Ratio Li12/NoLi} \]

\[ \text{Ratio All/NoLi} \]

⇒ 5 to 10% effect.

(Note: Error bars translate the spread of $\sum \text{iMon}$: no real statistical uncertainties.)
Results: Caveats

1. Solenoid was OFF during NoLi, ON for the rest.
   ◦ Could be that solenoid focuses somewhat incident into DC central dead zone. But...
   ◦ ... Hit profiles: no difference.
   ◦ ... Dipole vs. solenoid, both “All” config.: no difference
   ◦ ... No measured enhancement in MPs (which cover DC dead zone).

2. Impact of Li is as large on DC01 as on DC00
   ◦ While naively expecting particles suppressed by $^6$Li to be low energy swept away by SM1 fringe. But...
   ◦ ... (from Matthias) what’s suppressed are $\gamma$’s, which supply $e^+e^-$ all the way.
   ◦ Then, out of consistency: must be other contribution, sizable, besides $\gamma$’s:
     leakage of charge particles (putatively).
     Effect of “PE”, which does not affect DC01, could be a suppression of it
   ◦ Side consequence: effects should not be explainable in terms of ratios.

3. Two Li layers not better than one: compare “Ini” and “Li12”.
   More generally: No additivity
Results: Caveat #1: Hit profiles

- Hit profiles: All vs. NoLi. ⇒ No difference.
Results: Caveat #1: Dipole vs. solenoid

- No impact from target field  
  (“ADip” is 05/11-[0H00,11H19])

(As a comparison is also shown the, large, BMS effect.)
Results: Signal/Background

- Signal/Background: no difference.

(Note: Event ratio = 1.27)
Conclusions

• There is an effect.

• Moderate = 5 to 10 %

• Best config. = $^6\text{Li} \times 2 + \text{PE}$

  which happens to be the one eventually retained!

• No quantitative (even qualitative, *imho*) understanding of individual contributions.
Spares
Ion2 and iMon desynchronisation
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