And Another Run Taken June 6

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Overview

- Yes, we are in factory mode but...
  but still opportunity due to PEP-II problem

- Neutron generator worked again quite well
  - Startup quite fast
  - When running, current stable
    (no frequent dips to zero)

- 'Fast' running
  - Only 4 hrs 12’ from first turn of key to end of last run
  - Gathered 3 hrs 25’ data,
    $\rightarrow$ 81% up-time (similar to PEP-II...?)
• Turned generator off when enough statistics reached

• Details of good parts of Run 232:
  21:16 to 22:00  46’  ERROR 55 (current rising slowly)
  22:24 to 22:52  28’  current dropped to zero (dark current rise)
  22:55 to 01:06  131’  enough statistics
  01:06 to 01:25  19’  noise only

• Do we know how to operate generator?
  ○ HV turned on only 3 times: each time stable
  ○ Only one other hick-up:
    ERROR 58 (unknown to us) while starting up

Afterwards:

• Started Run 233 w/out generator
• Shift leader ended run after 3 hours 24 minutes
• Beams returned ∼ 15 minutes later
Statistics of Run 232

- Same plot as the last times...
- Fitting runs with old fit function + exponential background then integrating from 4 MeV to 7 MeV
- All plots show ratio with Run 177, June 2002 = good, long run
- Again very good statistics
Gain Shift Over Time

- Red = FB (forward barrel)
- Blue = BB (backward barrel)
- Black = EC (endcap)

Top plot: without bias correction
Bottom plot: with bias correction

Shift here given in % with sigma of distribution

<table>
<thead>
<tr>
<th>Runs</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>208/211+213</td>
<td>Dec27, Jan06, Jan13</td>
</tr>
<tr>
<td>216+217+218+219</td>
<td>Jan23</td>
</tr>
<tr>
<td>221+222</td>
<td>Feb18</td>
</tr>
<tr>
<td>224</td>
<td>Mar08</td>
</tr>
<tr>
<td>227</td>
<td>Apr19</td>
</tr>
<tr>
<td>228</td>
<td>May16</td>
</tr>
<tr>
<td>232</td>
<td>Jun06</td>
</tr>
</tbody>
</table>

bc gain shift (run-177)/177

gain shift (run-177)/177
Bias Correction:

- Applied right before digiCorr determined
- Determined from MC, comparing fit results with MC truth
- Effect of correction:
  - raises gain for low resolution (mostly by $\sim 1\%$)
  - lowers gain for high resolution
  - lowers resolution (mostly by $\sim 5\%$)
Now using Run 232 instead of Run 177 as baseline

- Red = FB
- Blue = BB
- Black = EC

Shift given in %
with error on mean

```
bc gain shift (run-232)/232
```
Conclusion

- Run 232:
  - Good statistics
  - Continuation of slow drop in gain

- Run 233:
  - Very long noise run
  - Will help Mark to fit spectra

- Next run:
  - At begin of summer shutdown
  - Perhaps will be last run with old generator