Aligning the Experiment

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MIPP Collaboration Meeting

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Overview

- Need to align detector before we do pass 3
- Questions to be answered:
  - Are alignment constants date dependent?
  - How do we pick a reference system? (see later)
  - How do we go about doing it? (see later)
- I can lead the effort of getting systems aligned, but suggestions are welcome, since this is the first time I'll be doing this

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Picking a Reference System

- If I'm not mistaken, a reference system requires 8 (arbitrarily chosen) parameters:
  - 3 points to define x- and y-axis, minus equation requiring that they are orthogonal
- I have the following proposal:
  - BC1&BC3 Z (2)
  - BC1&BC3 wide-angle plane locations (4)
  - BC3 orientation (2)

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Proposed Way to Do It

- Align beam chambers (few parameters, no B-field)
- Align tracking chambers wrt beam chambers
  - Tune relative magnet strengths in the process?
- Align other subsystems wrt chambers

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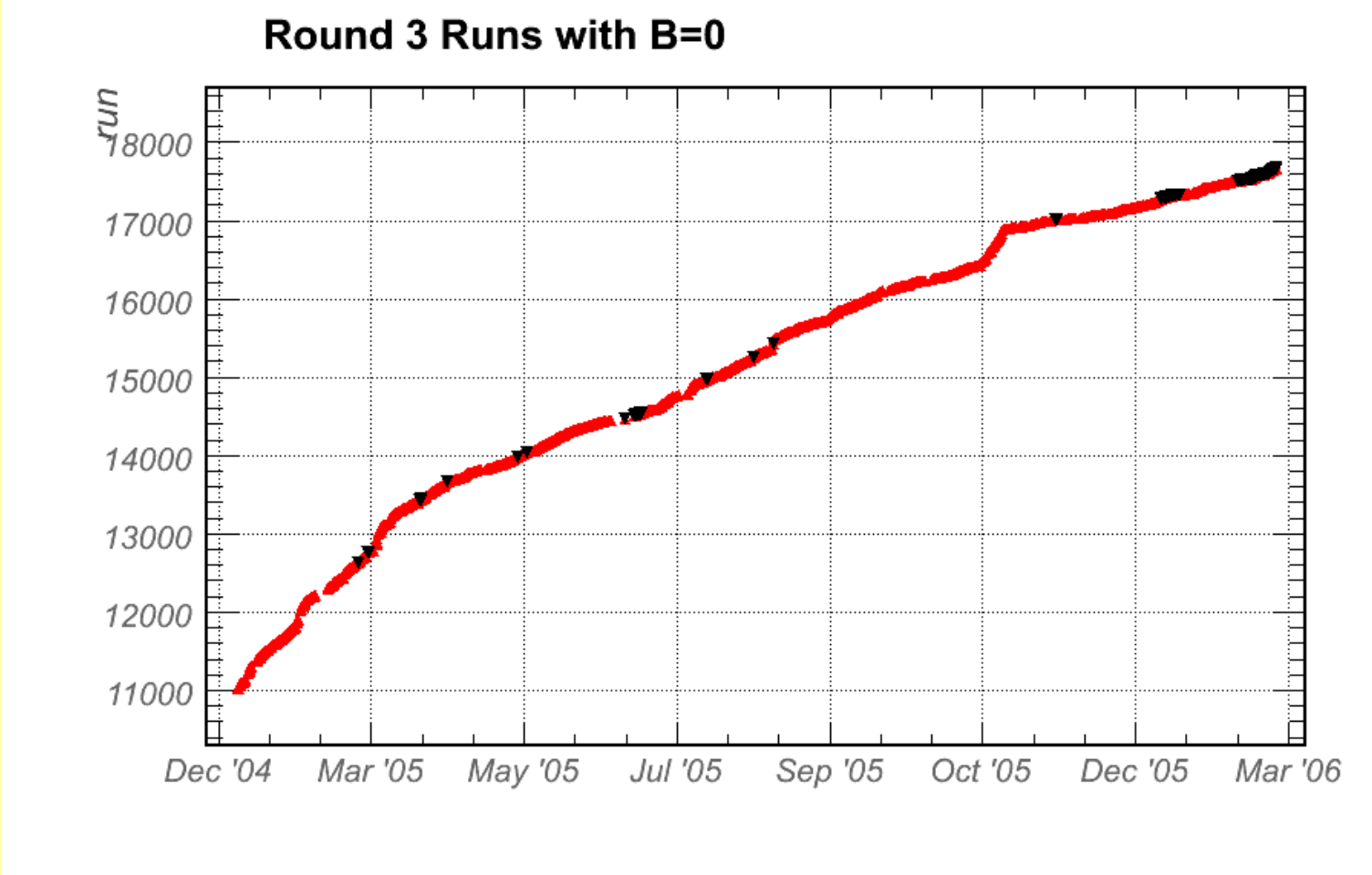
We Don't Have Field-off Data



- Back dots are runs with field off
  - abs(JGG)<1kG and abs(Rosie)<1kG

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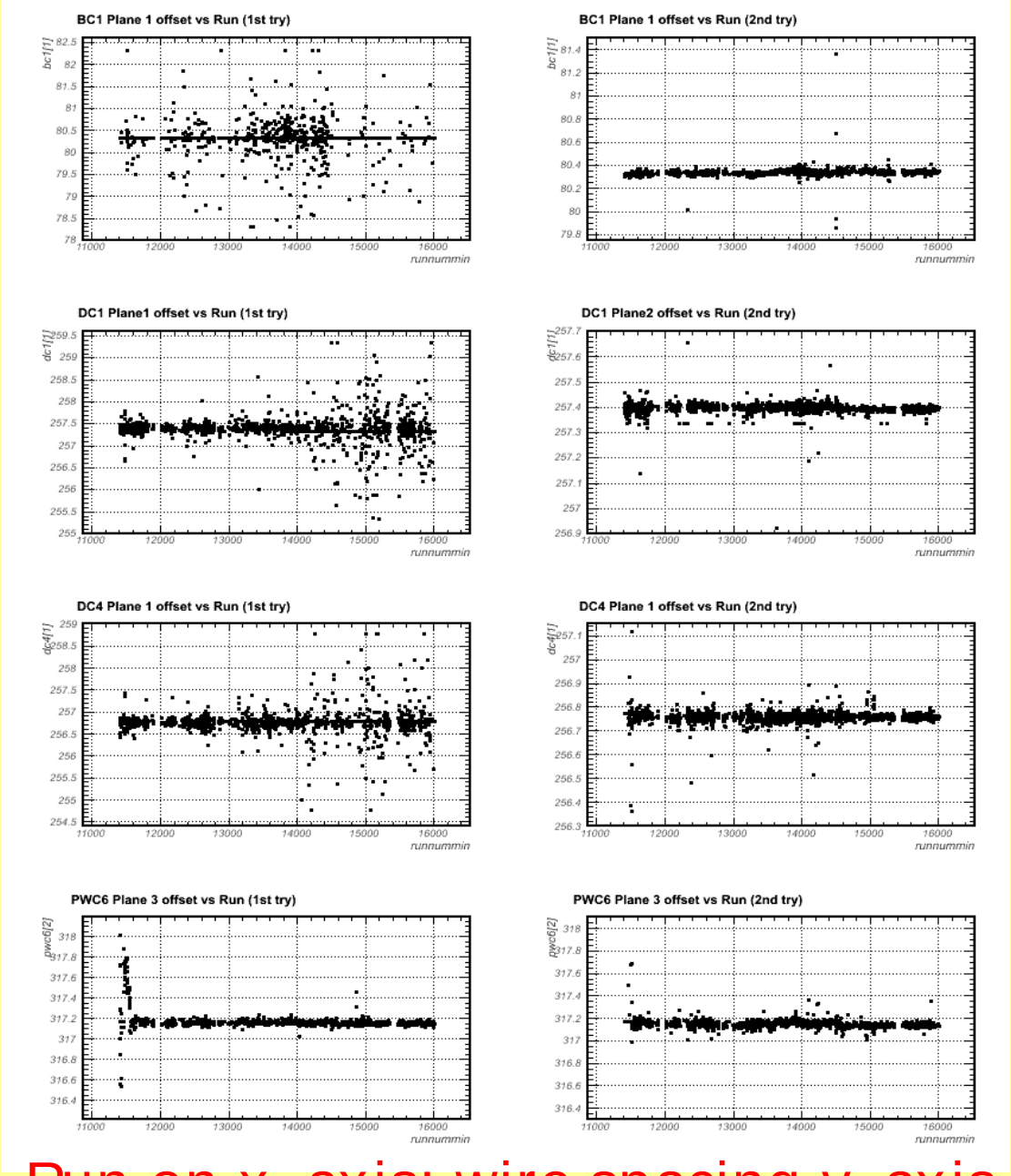
Internal Chamber Alignment



Run on x- axis; wire spacing y- axis

- Alignment was done twice
  - Taking all data (left, bad)
  - Taking clusters from track segments (right, better)
- Internally chambers are mostly stable to ~0.1 wire spacing; need to check outliers

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(Most Likely) Plan

- Do BC alignment in pass 2 for each run
  - Do all 3 chambers at once
  - Ignore 5 GeV runs?
  - Track stability; group runs to improve statistics
- Work on alignment between pass 2 & 3
  - Dedicated alignment pass 2.1?
- Create DST's with reasonably aligned detector

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