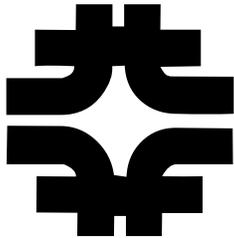


# D44 Data Archiving



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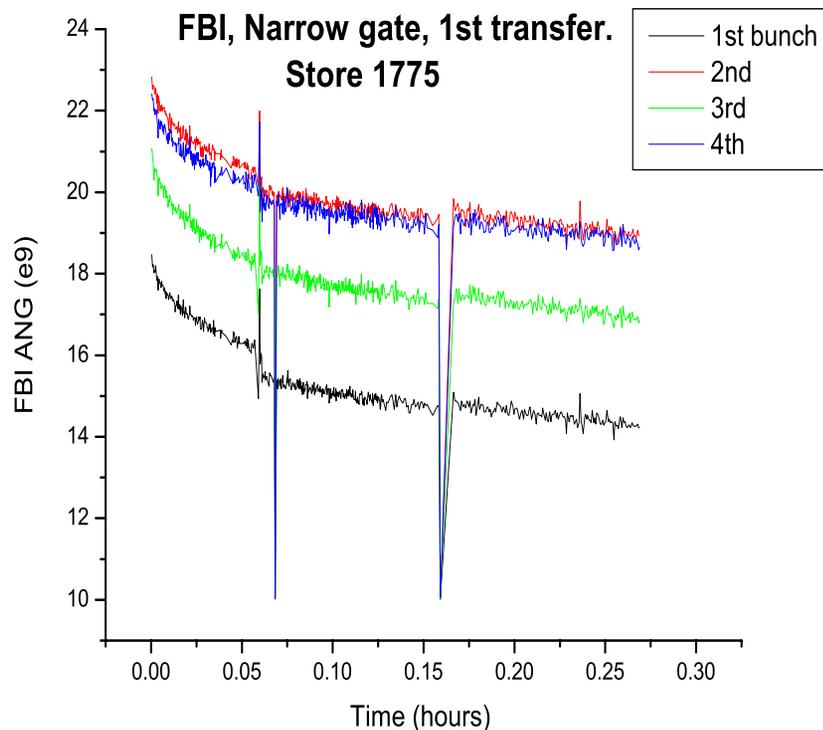
# “1Hz” D44 (Lumberjack) Data..

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- Is useful! Used daily in MCR. Detailed Analysis of non-trivial feature.. We need to go back to it, on occasion: Example: pbar life time at 150 GeV in TeV.
  - The SDA gives us only 9 measurements..
  - The “15 min” D44 data from node Arkv1 is even fewer measurements..
  - The pbar lifetime changes quickly, from  $\sim 10$  min. to hours, over  $\sim 10$  min.
  - Details matters..

# 1Hz, D44 Data is required..

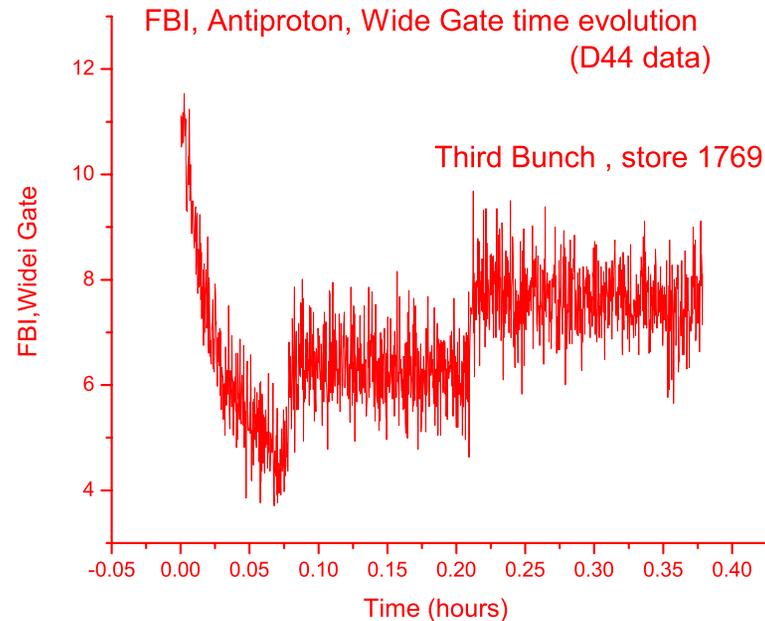
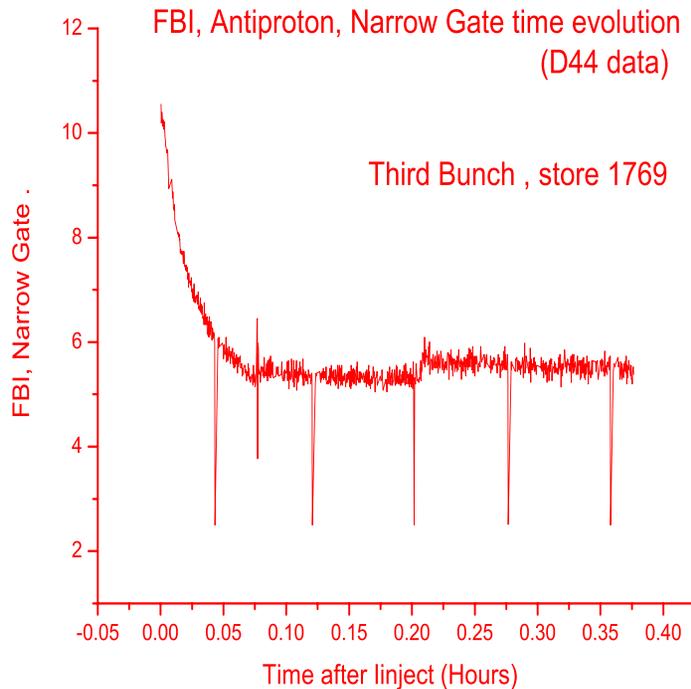
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- Non trivial time evolution.. 9 (9 SDA Sets) measurements is not enough to characterize it.
- And “noisy” (negative spikes).
- With discontinuities, due to cogging (background under the AC coupled signal changes)
- With occasional gaps (DAE’s are busy while we shoot).
- => fits will done for each cogging period
  - With algorithm to reject bad points.

# Using the Narrow Gate is the thing to do...

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The background subtraction is  $\sim 5$  times larger for the Wide gate

# Requirements

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- Record and save critical devices at the required frequency:
  - Critical: not all of them! E.g., Intensity, emittances, relevant bus currents.. ...
  - Frequency: driven by analysis requirement. Varies from device to device (SyncLight ~ 1 min, FBI: ~1Hz )
  - Not a replacement for FTP and SnapShots. (triggered, large amount of data for small period).
- Provide software to easily retrieve the information, transparently.
  - Going to Lumberjack node is data still there.
  - Else, to the repository.
- Centralized: the user should not have to know on which Lumberjack node the data resides! (negotiable requirement, centralized information has it's own drawback).

# Strategy

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- Option 1: Use the existing infrastructure, “save” existing tables (turn of circular buffering) and provide the necessary software to retrieve “previous” table.
- Option 2: Create a new repository. Using the existing OSD A-D44 data, retrieve the data and save it “elsewhere”. Provide new software to retrieve this information.

# Status

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- Option 1: Not yet attempted. Eager to try, for instance using the Inst2 (or other) test node.
- Option 2: A prototype has been written, running as we speak on patmu3.fnal.gov. (Linux) Some preliminary data has been analyzed on a window system.

# Design of the Prototype D44 Archiver.

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- Retrieve data continuously. Polling loop: over every ACNET variable of interest, on periodic (~hour) basis.
- Bulk data and Meta data:
  - Bulk data: flat ASCII files, simple tabular form (time stamp – value). Time stamp are with respect to the beginning of the file. Values are printed using specified formats.
  - Meta-data: List of files, with adhoc time stamp.
  - No formal database: rely on Unix file system. (One variable corresponds to one directory)
  - The real system should have a conventional data base to hold this repository.

# Features of the Prototype D44 Archiver.

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- Data Compression: formatted ASCII + zipping:
  - FBIANG, 1Hz, ~ 20 MgB/day, 5 MgB/day Zipped.
  - Anticipated total for TeV devices: 50-100 Mgb/day, zipped.
- Error recovery, robustness:
  - Can restart where it left off..
  - ACNET variable granularity
  - Some robustness, (against missing). Still need to come up with a sensible strategy if repeated failure and encountered..
- Accessors:
  - delivered data time ordered, with no repeats

# Missing Features of the prototype

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- Enstore ( or equivalent) archiver not yet implemented.. (relying on the disk to store the data for now.)
- No Database for meta data. (rely on repository files).
- Automatic restart of the java writer, after “prolonged” inactivity of nodes, of breakdown of D44-servlets
- More flexible accessors
- Data Browser.
- Incomplete set of archived devices.

# Outlook

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- Where do we go from here?
  - Implement “limited archiving” with existing Lumberjack data tables. Write OSDA-D44 interface to data query (and/or upgrade D44 servlets. ) ?
  - Keep polishing up the existing prototype. ?
  - Start implementing the real thing based on prototype experience
- Collect the devices for which we want an archive !
  - Please, let me know which one (this is addressed to the Beam Physics Community!)