

# BB Event Display

29/08/21

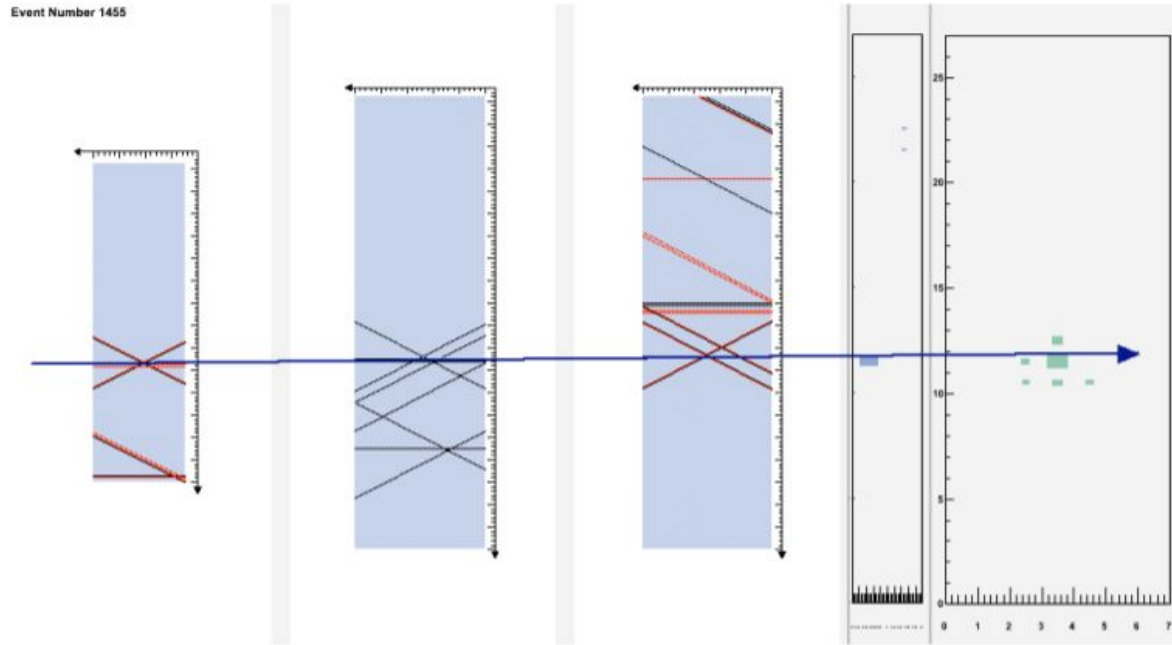
# Idea / Prerequisites:

Starting with pre-existing Grinch and Hcal GUIs\*:

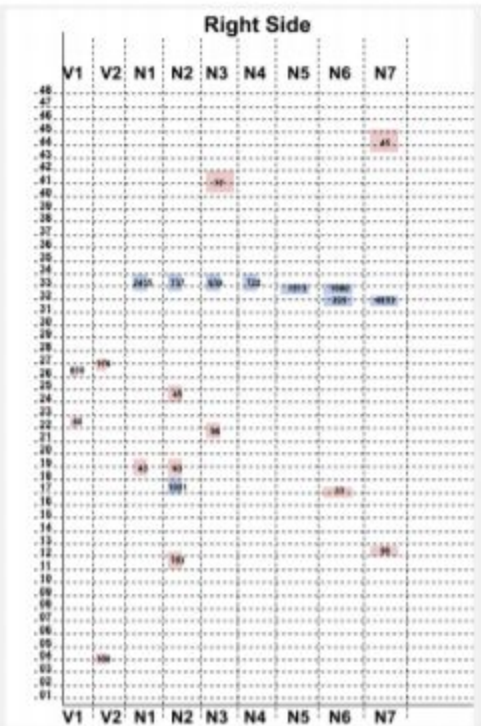
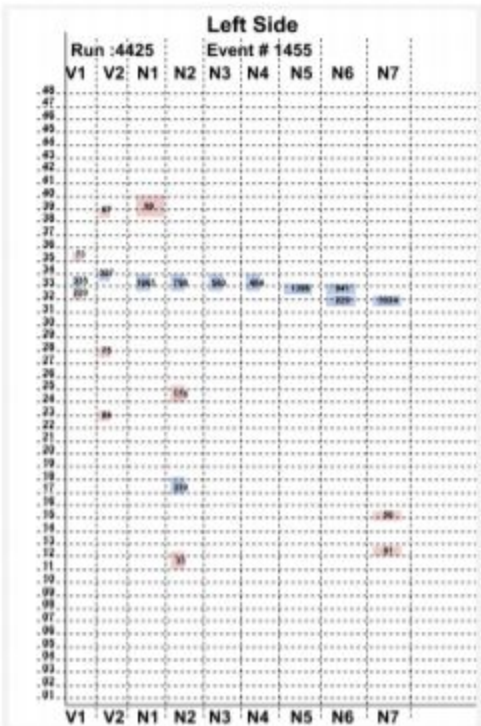
- To design a Gui containing a 2D Bar / PMT display for Grinch, Preshower, Timing Hodoscope & Shower
- Track events through spectrometer one at a time. Controlled via buttons on Gui (OR command line input)
- Display amplitude of calorimeter hits via color / size scaling
- Display estimate position of hits on hodoscope using time difference between 'good' hits on both pmts of a bar

\*thanks to Bradley and Scott for grinch and hcal gui codes!

# Inspiration: $G_E^N$ at High $Q^2$ (E02-013)



Credit: Timothy Ngo (2007 Thesis)



Bar numbers refer to N1,N2,N3,N4 bars only.

Run :4425      Event # 1455 of 68579

$P_{diff}$  : 0.0104708413

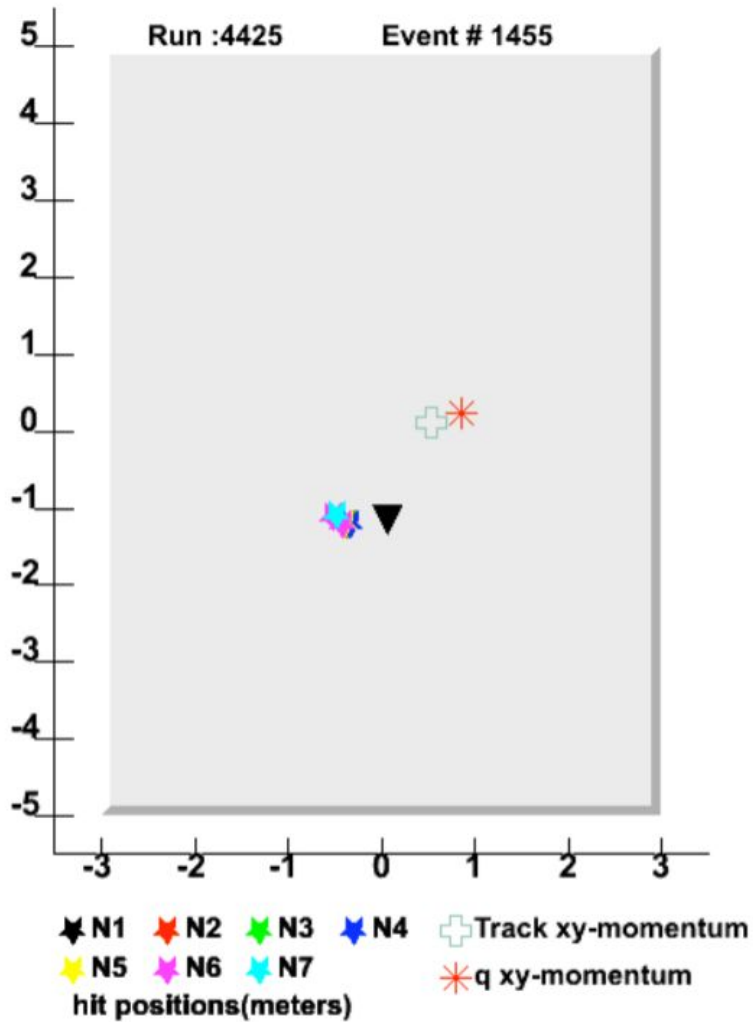
$P_e$  : 1.19095374

$P_p$  : 1.58120549

$\theta_a$  : 49.0091679

$\theta_p$  : 34.6471848

BigByte shower 2844.29993 MeV



# First Working Version (27/8)

The image shows a screenshot of a software application window titled "DisplayBB : root - Konsole". The application is divided into two main sections: a visualization area on the left and a terminal window on the right.

The visualization area, labeled "Tab 1", displays a grid-based simulation. It features a large grid of small circles on the left, with two horizontal bands of blue circles at the top. To the right of this grid are three vertical columns of smaller circles. The first column is mostly empty, with a few blue circles at the bottom. The second column has a single blue circle in the middle. The third column has a red horizontal bar in the middle, with blue circles above and below it. The bottom of the visualization area has a control bar with buttons for "Display Entry", "7", "Next Entry", and "Exit".

The terminal window on the right shows the following output:

```
np-phigaryp> root -L DisplayBB.C
root [0]
Processing DisplayBB.C...
Warning in <TClass::Init>: no dictionary for class ThaEvent is available
Warning in <TClass::Init>: no dictionary for class ThaEventHeader is available
Warning in <TClass::Init>: no dictionary for class ThaRun is available
Warning in <TClass::Init>: no dictionary for class ThaCodaRun is available
Warning in <TClass::Init>: no dictionary for class ThaRunBase is available
Warning in <TClass::Init>: no dictionary for class ThaRunParameters is available
Warning in <TClass::Init>: no dictionary for class SBSSimFile is available
Displaying event 0
root [1] Displaying event 1
Displaying event 2
Displaying event 3
Displaying event 0
Displaying event 1
Displaying event 2
Displaying event 3
Displaying event 4
Displaying event 5
Displaying event 6
Displaying event 7
Displaying event 8
Displaying event 7
Displaying event 0
Displaying event 7
[]
```

## Changes in process:

- Command line input of run number -> loads rootfiles for runnum
- Command line control of event toggling
- Addition of opaque overlay canvas with track through detectors

DisplayBB\_dev.C - emacs@np-sigma.physics.gla.ac.uk <@np-sigma.physics.gla.ac.uk>

File Edit Options Buffers Tools C++ Help

Run: 10

```
for(i
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}
//---
// Ho
//---

for(i
bar
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hit
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dis
gSY
std::
to stop
getli
}
}
```

Display Entry 0 Next Entry Exit

----- DisplayBB\_dev.C Bot L473 (C++/l Abbrev Isearch)  
Overwrapped I-search: displayevent

() np-sigma - Konsole

File Edit View Bookmarks Settings Help

```
np-sigma.garyp> root -l DisplayBB_dev.C
root f0)
Processing DisplayBB_dev.C...
Enter Run Number
10
Warning in <TClass::Init>: no dictionary for class THaEvent is available
Warning in <TClass::Init>: no dictionary for class THaEventHeader is available
Warning in <TClass::Init>: no dictionary for class THaRun is available
Warning in <TClass::Init>: no dictionary for class THaCodaRun is available
Warning in <TClass::Init>: no dictionary for class THaRunBase is available
Warning in <TClass::Init>: no dictionary for class THaRunParameters is available
Warning in <TClass::Init>: no dictionary for class SBSSimFile is available
Displaying event 0
Display options: Press <enter> for next event. Enter event number to display specific event, or q to stop.
Displaying event 1
Display options: Press <enter> for next event. Enter event number to display specific event, or q to stop.
```

() np-sigma



# TBC Features Today / This week

- Calorimeter block size scaling with amplitude of signal above some threshold.
- Addition of Gems to Display - starting with UVa UV
- Syntax upon startup for User Friendliness
- Extend run number input to each subsystem (currently loading in 3 rootfiles -> need 3 different run numbers)

# Current Issues / Bugs

- Hodoscope hit marker very rough (position estimate usually falls outside of bar itself)
- GUI buttons and command line lock each other out upon use.
- Startup has started skipping first event

# Requirements

- Gem, BBcal, Hodoscope, Grinch cosmic files - (eventually full sbs rootfile)
- Proper analysis code for each subsystem - currently using simple amplitude > x cuts to display examples
- Feedback / Suggestions