BigBite Analysis

5.89 GeV Live Time Issues and Trigger Type Runs

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Outline

5.89 GeV Live Times

- A lot of runs have a low live time that does not agree with the HALOG (red markers)
- Low live times are due to two reasons

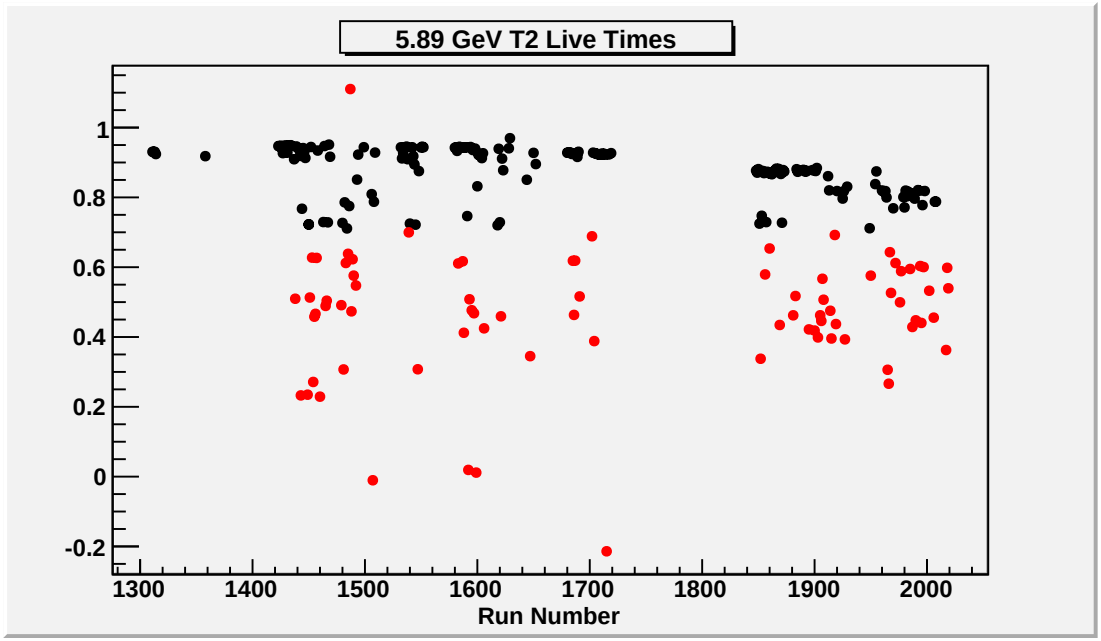

Figure: 5.89 GeV T2 trigger live time calculation. The red markers show runs where the live times were low and did not agree with the HALOG. The black markers show runs with live times that did agree. The runs marked in black were used in the nitrogen dilution factor analysis.

Low Live Times Reason 1

- About half of the runs produced a tree loading error for at least one of the segmented ROOT files for that run
- Error in <TChain::LoadTree>: Cannot find tree with name T in file
- This error results in loosing all events from the segmented ROOT file that was not properly loaded
- Error seems to have originated during initial ROOT file replay (replayed on the farm)

Low Live Times Reason 2 (1)

- Other half of the low live time runs had correctly loaded ROOT file segments
- To investigate why these have a low live time, several variables were looked at:
  - Beam trips, L1A trips and scalar T2 counts
  - Trigger types and T2 trigger TDC
  - ROC syncs
- Compared these variables for a good live time and bad live time run

Scalar Plots

Run 2006

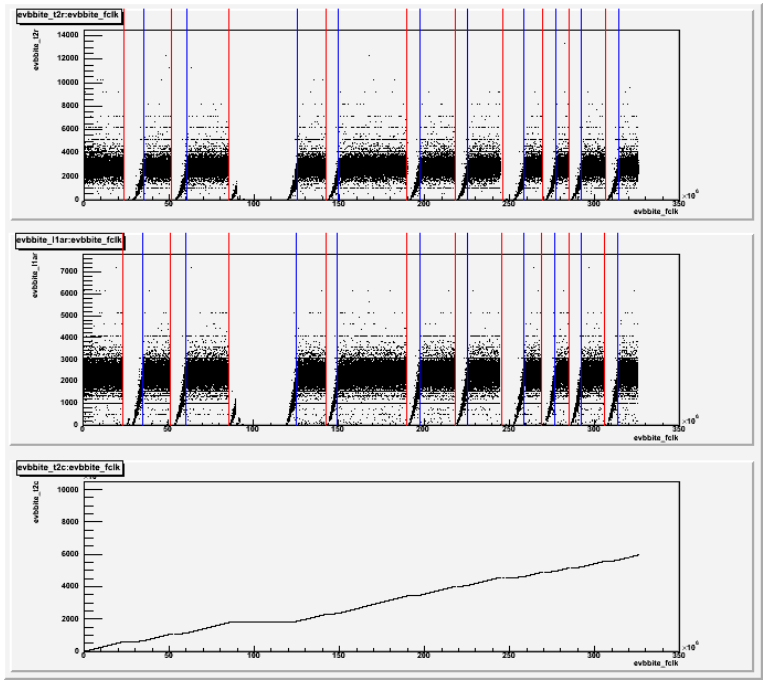

Figure: Top plot shows the beam rate vs clock count, middle plot shows the L1A rate vs clock count and the bottom plot shows the T2 scalar count vs clock count. The red lines mark the start of of the beam trip cut and the blue lines mark the end of the beam trip cut.

Run 2008

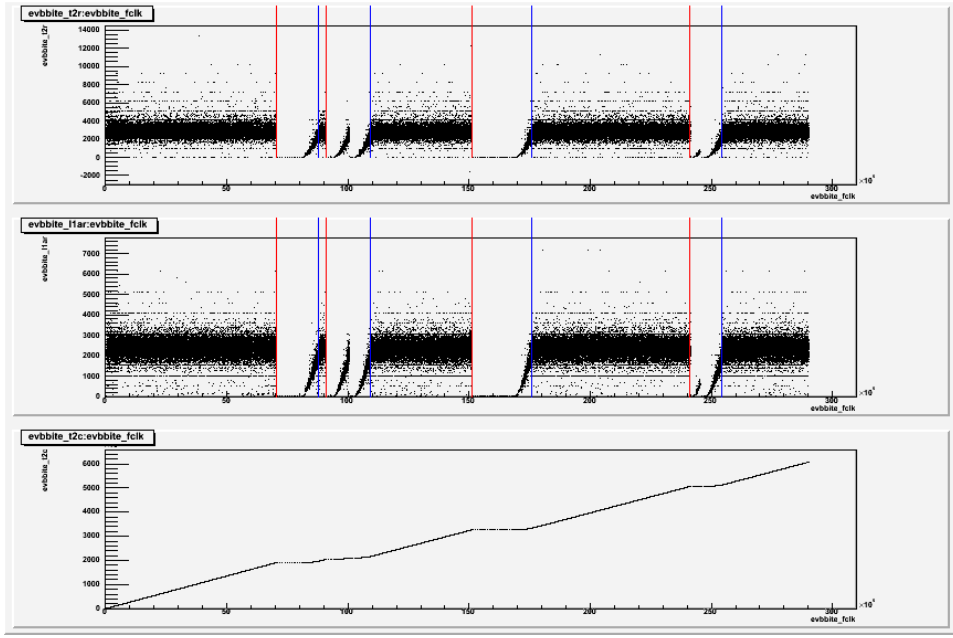

Figure: Top plot shows the beam rate vs clock count, middle plot shows the L1A rate vs clock count and the bottom plot shows the T2 scalar count vs clock count. The red lines mark the start of of the beam trip cut and the blue lines mark the end of the beam trip cut.

Trigger Plots

Run 2006

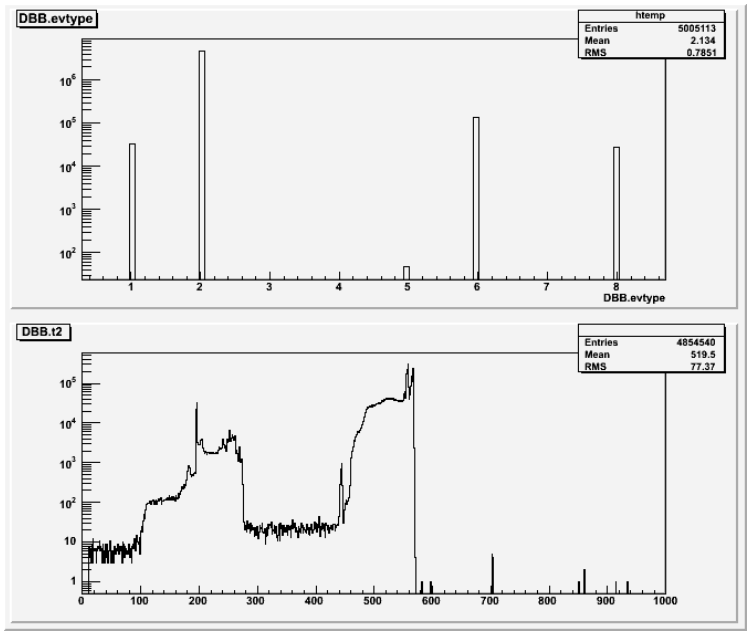

Figure: Top plot shows the trigger types recorded for each event. The bottom plot shows the T2 trigger TDC.

Run 2008

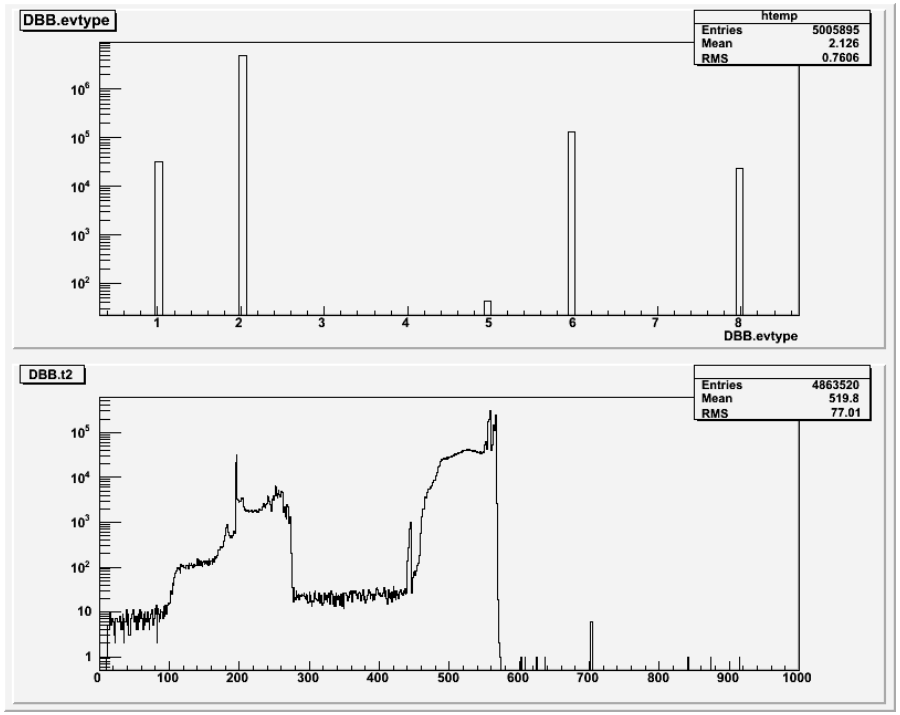

Figure: Top plot shows the trigger types recorded for each event. The bottom plot shows the T2 trigger TDC.

ROC Sync Plots

Run 2006

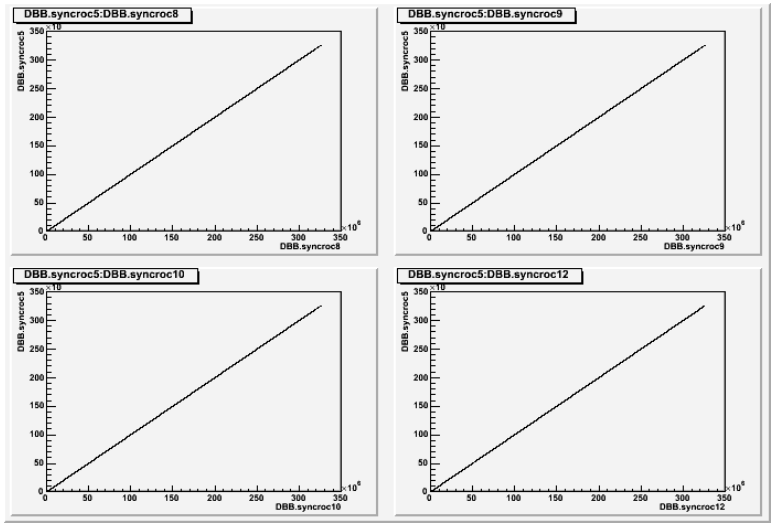

Figure: ROC 5 vs various other ROCs to check for sync issues.

Run 2008

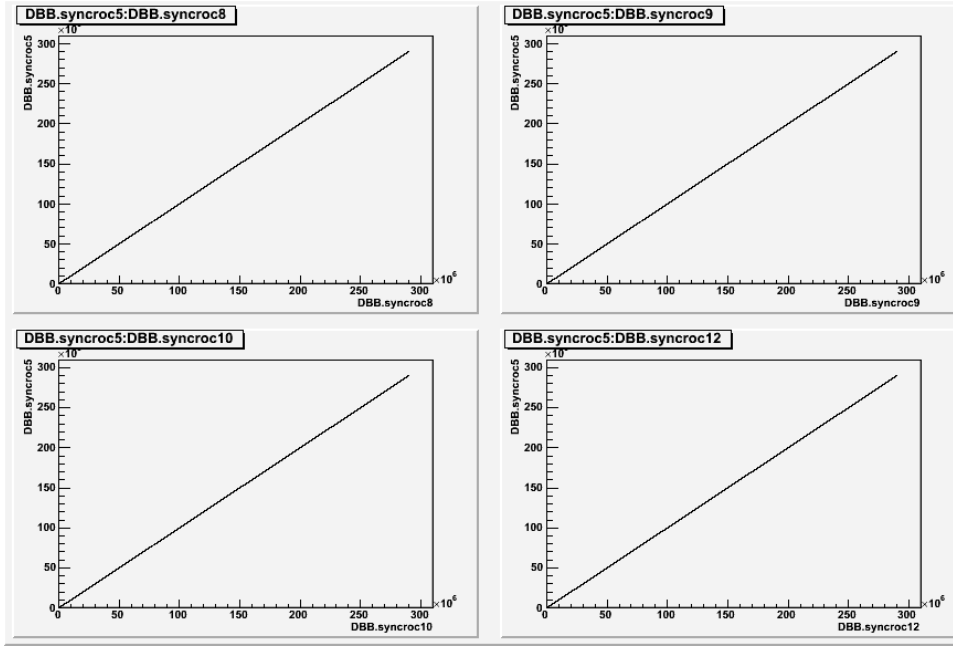

Figure: ROC 5 vs various other ROCs to check for sync issues.

Low Live Times Reason 2 (2)

- Variables for good and bad live time runs seem to be in agreement
- The other check I did was to compute the live time by removing the beam trip cuts
- With no beam trip cut, all of the low live time runs agree with what is shown in the HALOG $(\sim 70 - 90\%)$
- Checked three good live time runs with no beam trip cut and new live time changed by $\sim 0 - 1\%$
- Second reason for low live time a result of counting when applying beam trips?

Special Trigger Runs

- Found special low current trigger run set
- Could be used for trigger efficiency study?

Run	T1 Pre-scale	T2 Pre-scale	T6 Pre-scale	Beam Current (μA)
1363	570	1	12	5
1364	570	1	1	1
1365	70	1	1	1
1366	10	1	1	1
1367	1	1	1	1
1368	1	1	1	1

Table: Shows trigger pre-scales for low current run set at beam energy of 5.89 GeV.

What's Next

- Look more into in-plane angle shift
- Look at run by run pion asymmetries
- Fit approximate analytic solution to NMR data
- Compute preliminary 4-pass g_1,g_2 and d_2