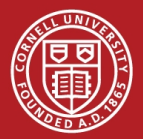


Cornell University
Laboratory for Elementary-Particle Physics

First Look at the December 2016 Data from the Shielded Stripline Detector at Q15WA

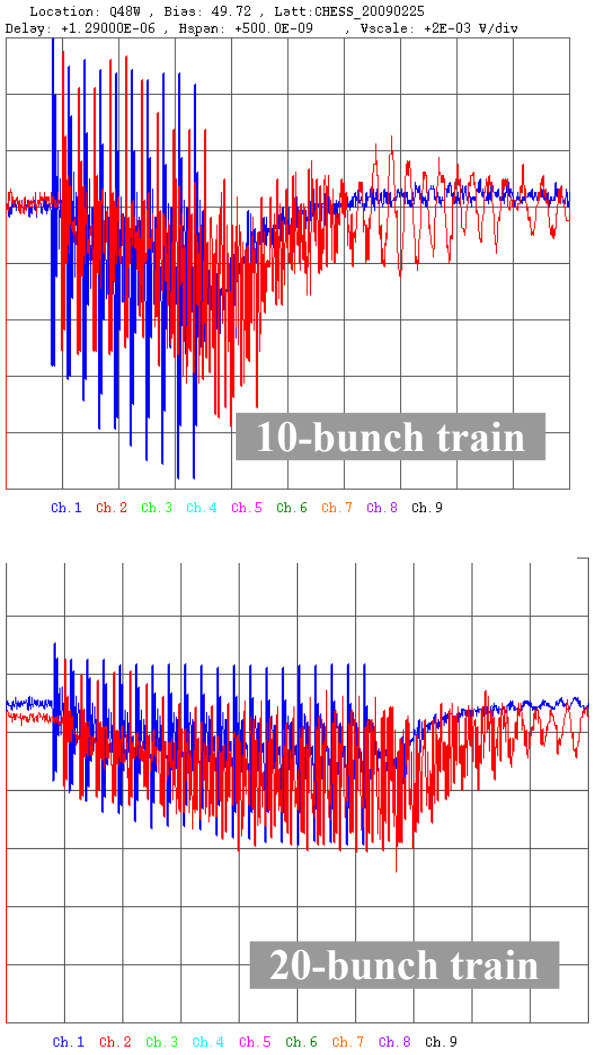
Jim Crittenden and John Sikora

Electron Cloud/Impedance Meeting

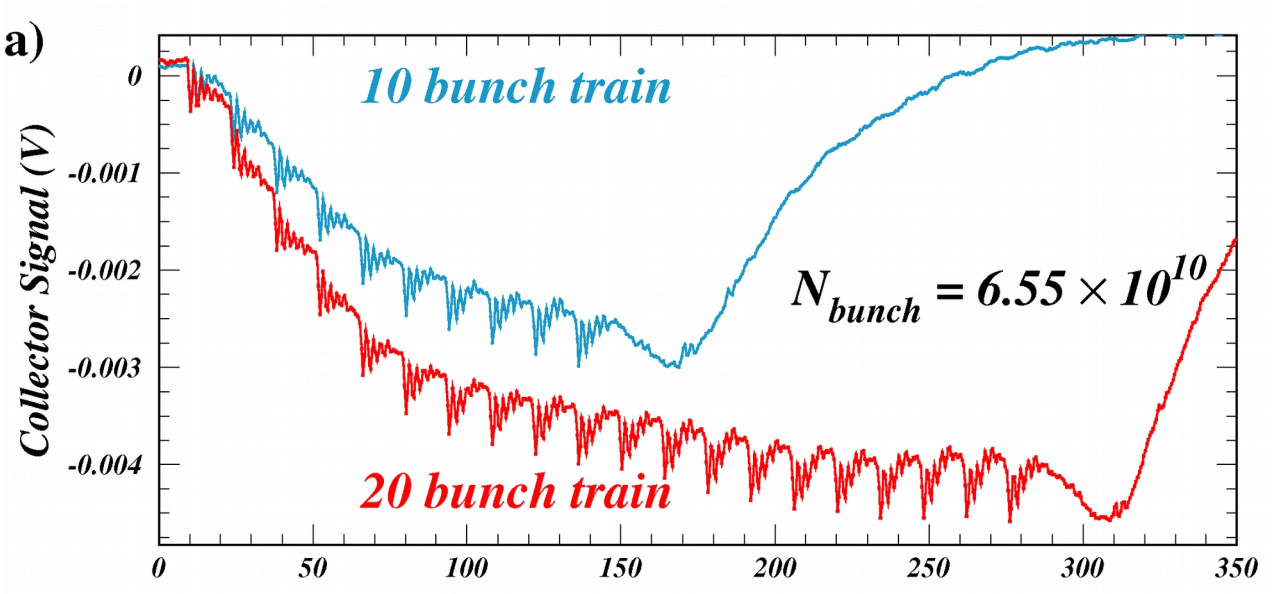
11 January 2017

Reminder of the 2013 data from Q48W

18-19 June 2013



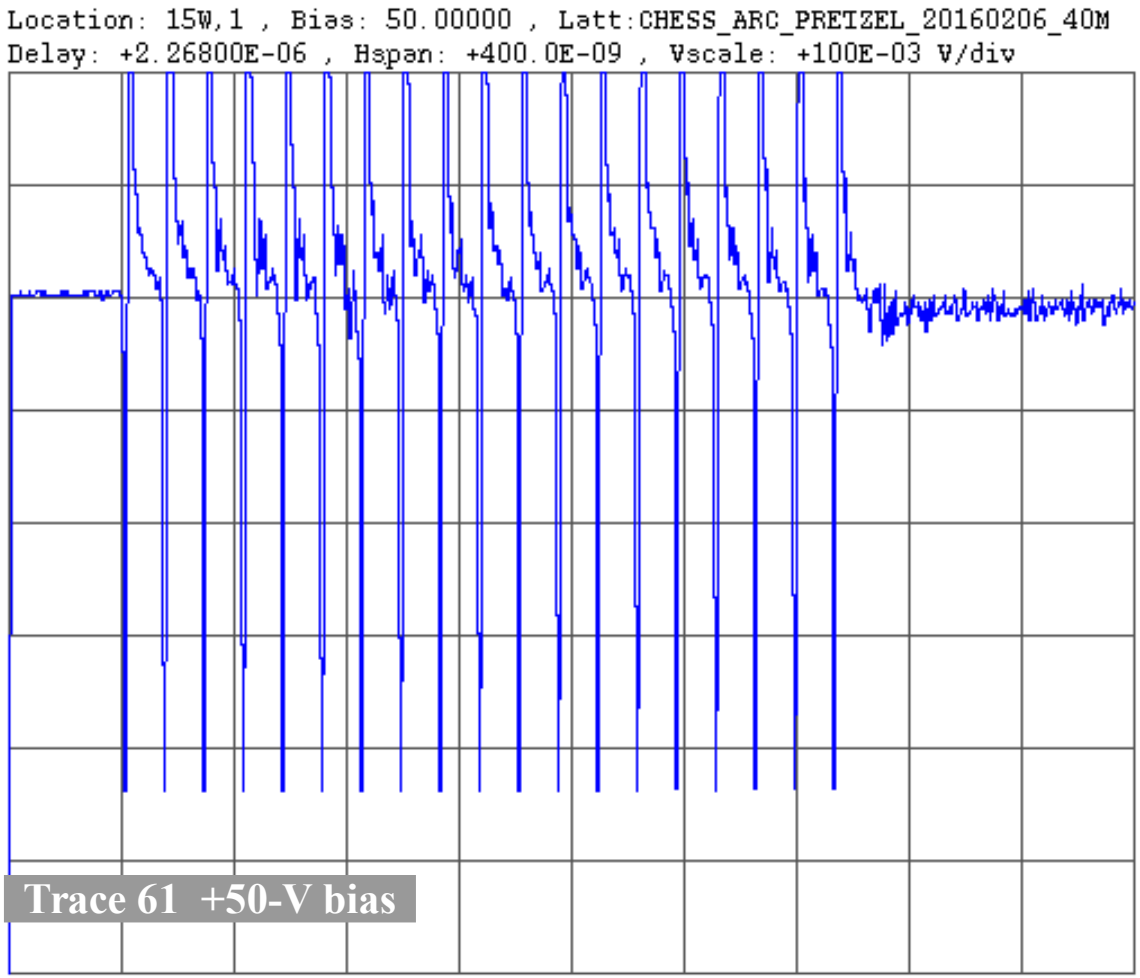
Trapping discovery plot from Chris Shill's 2013 REU project



Major improvements to the signal were made by improving grounding in 2014, but the application of a post-processing filter with 12-ns time constant remained necessary.

The analysis in PRST-AB 18 041001 (2015) applied the filter to both the measured and modeled signals.

Q15WA signal of 14 Dec 2016 for e+ 20-bunch train, 8 mA/bunch



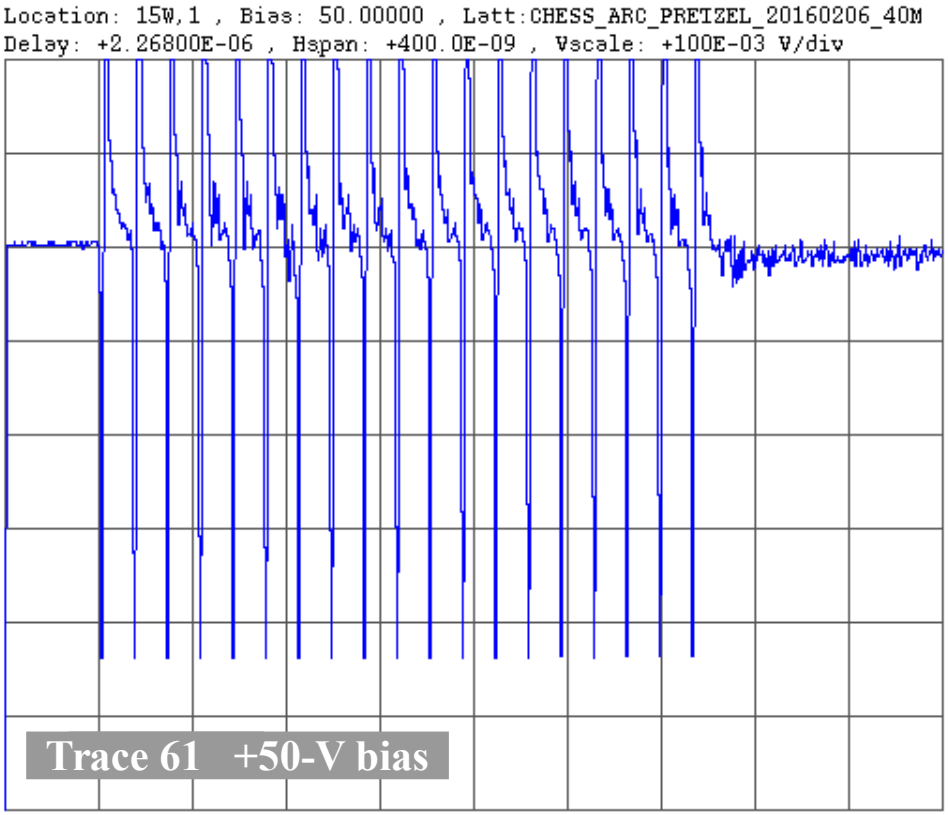
Central stripline
Bias +50 V
Field gradient 3.5 T/m

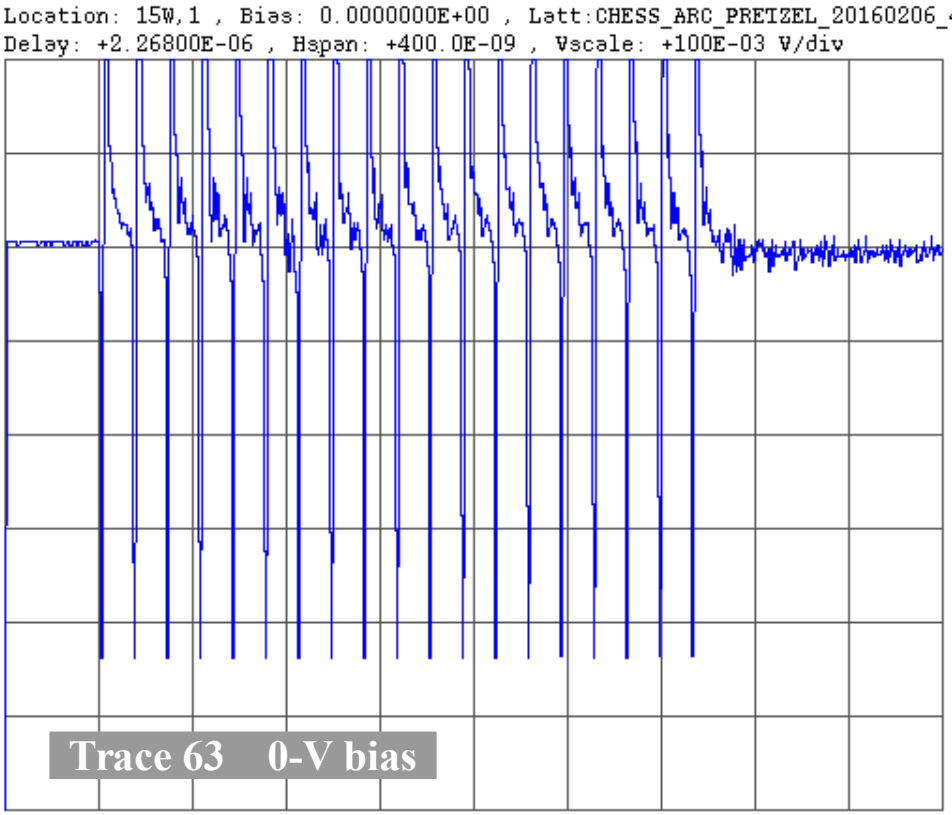
A prompt signal from the bunch passage produces a signal of about +200/-400 mV, independent of bunch current. Mysterious.

The cloud signal shows up prior to the following bunch passage as a negative excursion.

We may need to use a baseline given by the signal with 0-V bias.

Comparison of signals with 0- and 50-V bias

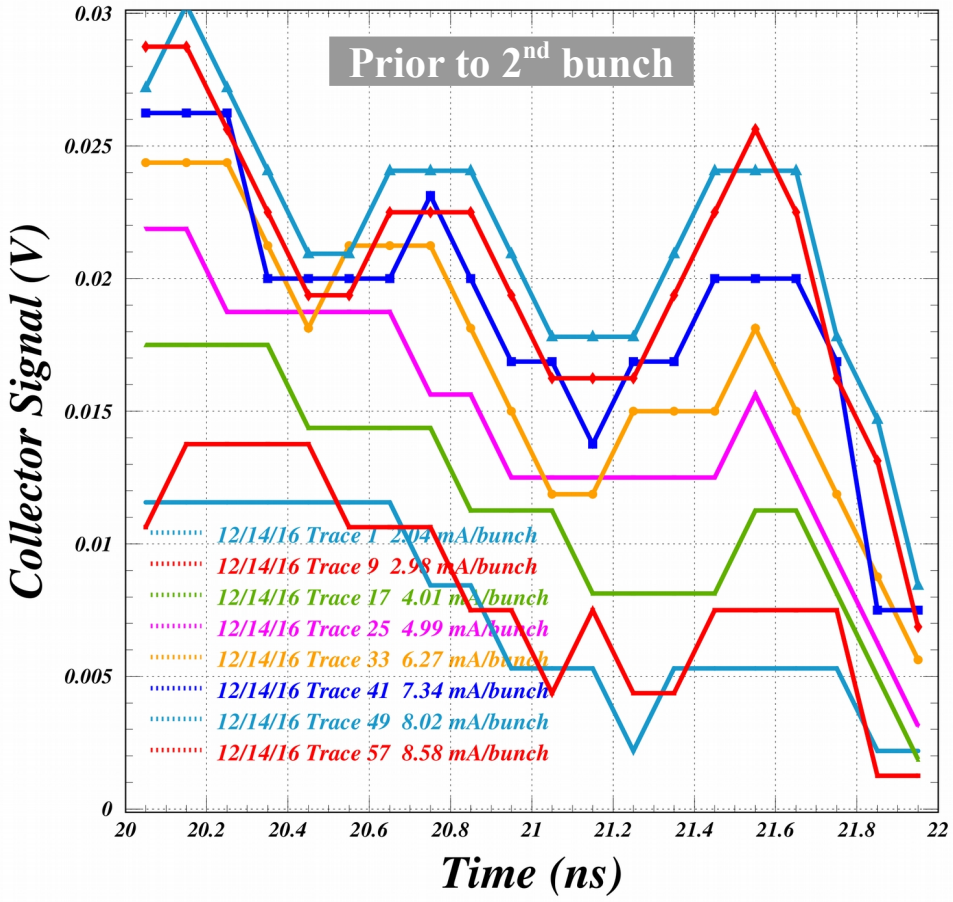


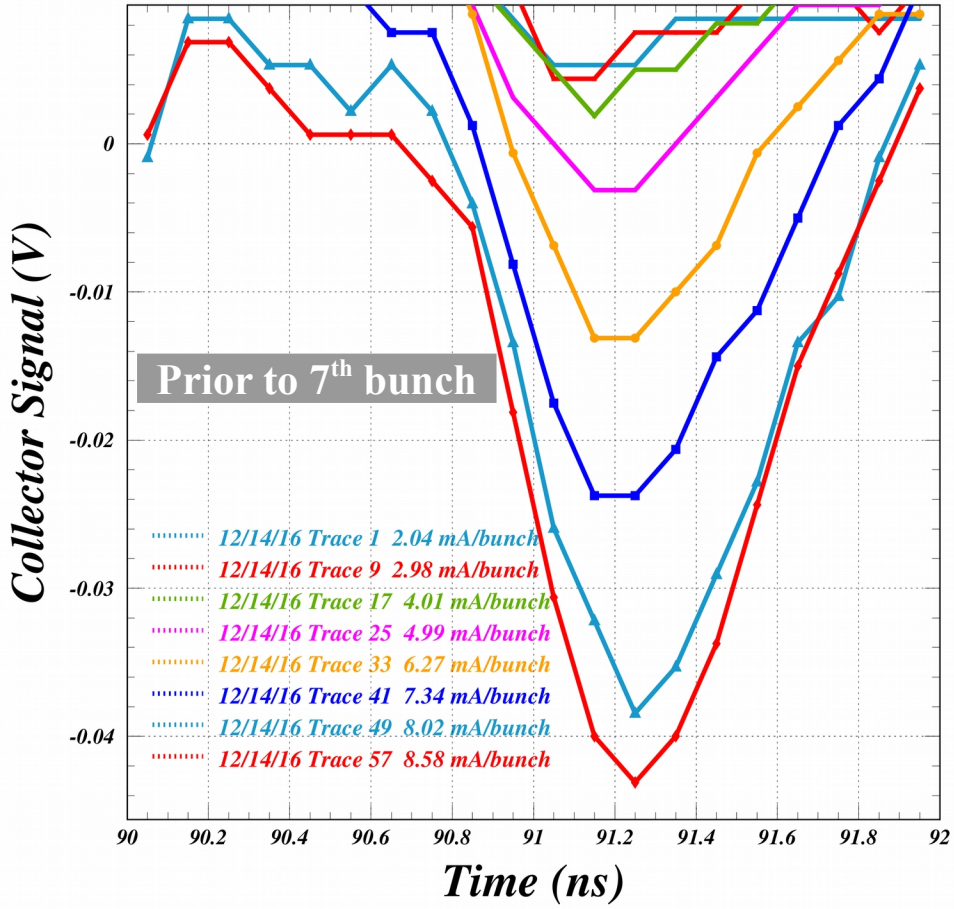


Clearly a tough business.
If there is a signal, there it is less than 100 mV.
How much cloud signal is in the 0-V data?
Let's see if we can learn something by looking at the dependence on bunch current.

A hint of a signal– Stripline 1

Bunch current dependence of signal just prior to the 2nd and 7h bunch passages

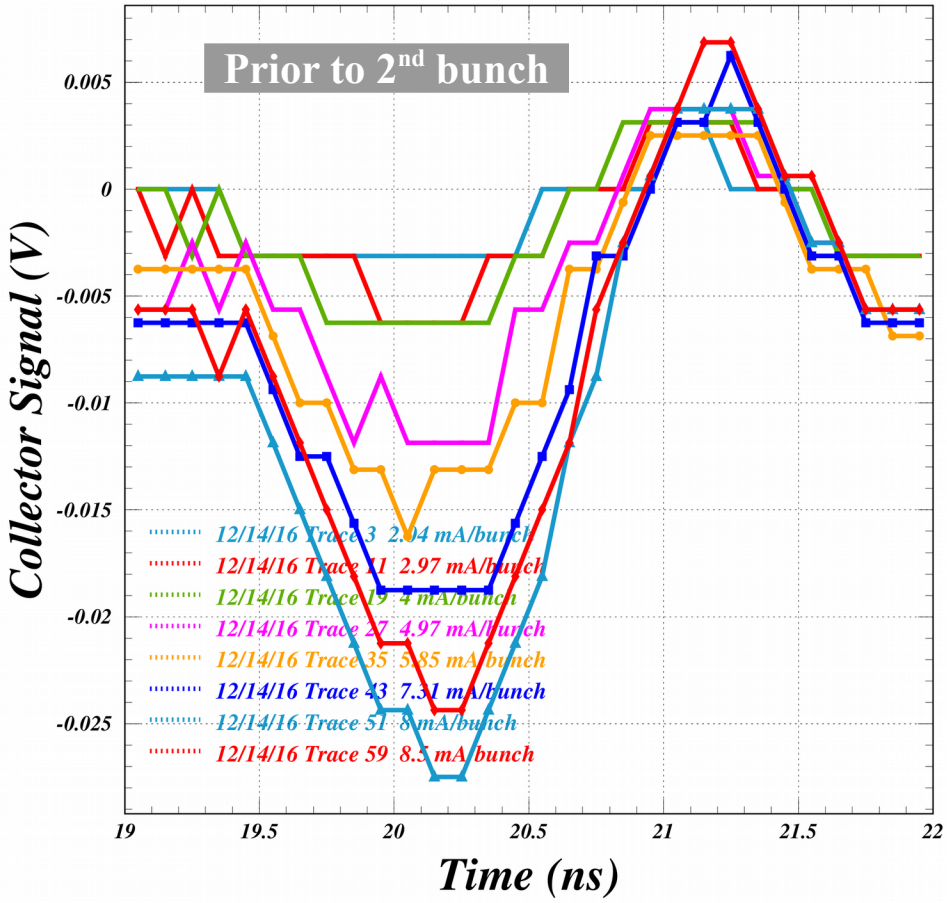


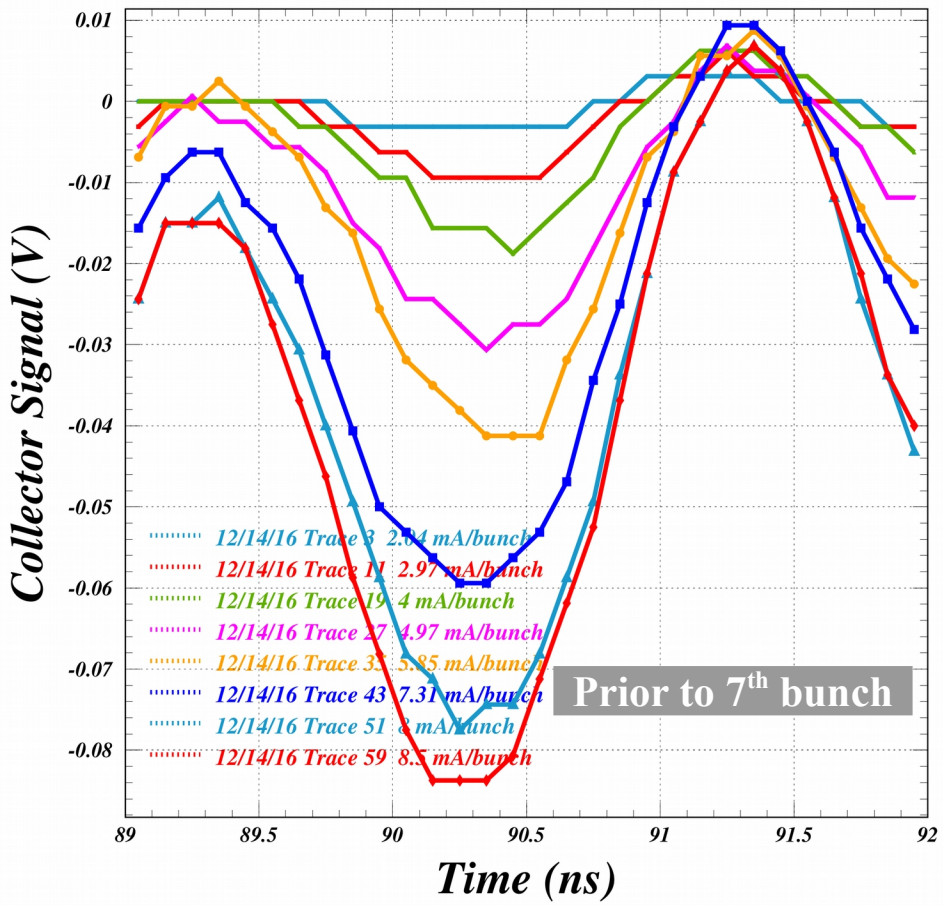


We have 0.1-ns time bins for bunches 1-7 and bunches 19-20.
We have 0-V bias data only for 20 bunches and 0.4-ns time bins.
So using the 0-V bias data as a pedestal will take some work.
Here I compare a 2-ns span just prior to the 2nd bunch with the one just prior to the 7th bunch.

A hint of a signal – Stripline 2

Bunch current dependence of signal just prior to the 2nd and 7h bunch passages





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We have 0-V bias data only for 20 bunches and 0.4-ns time bins.
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Here I compare a 2-ns span just prior to the 2nd bunch with the one just prior to the 7th bunch.