

Cavity BPMs Analog Output

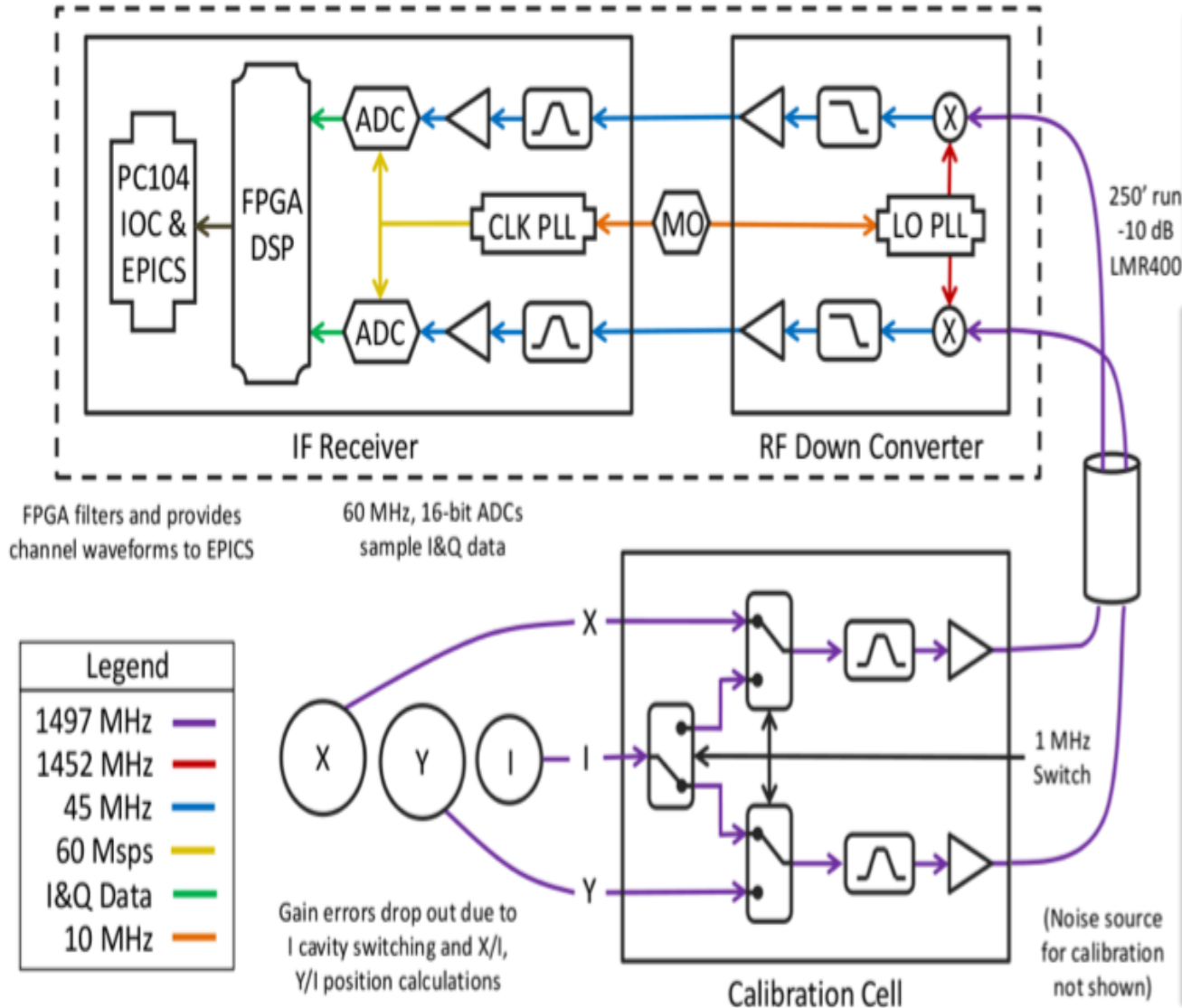
Ye Tian
Syracuse University

- Parasitic Run Analogy Output
- Cavity BPMs Position Calibration
- Milestone and Outlook

Cavity BPM Electronics

John Musson

BPM Receiver Chassis



1) EPICS Data:

IPM1H04B*

IPM1H04C*

IPM1H04D*

2) DAC:

Parity DAQ, ADCs

Signal

✓ only noise for cavity signal

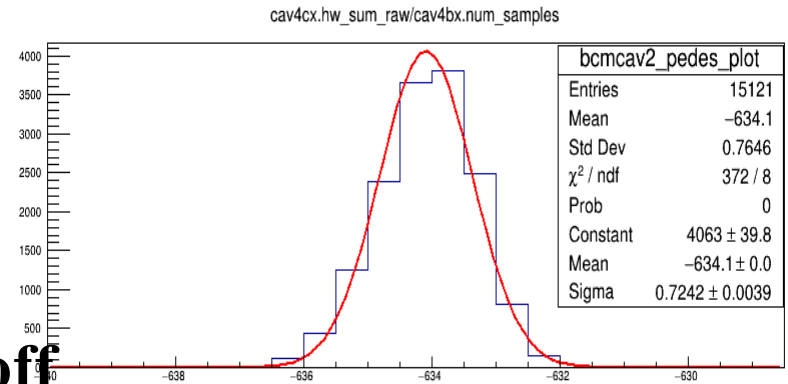
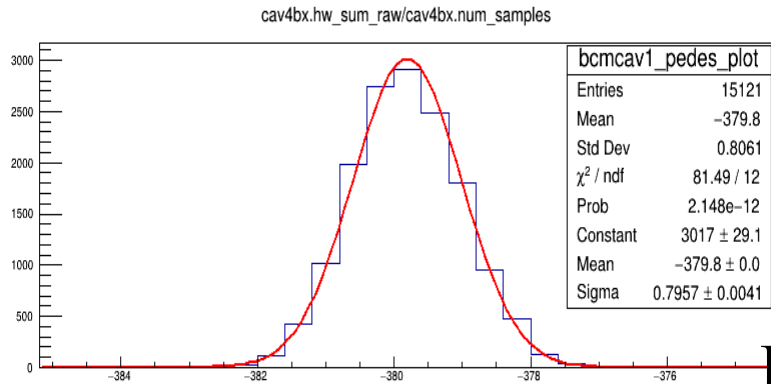
Works !

ADC

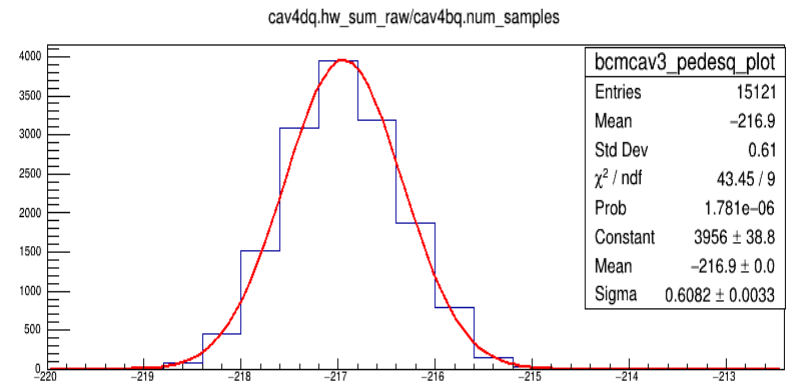
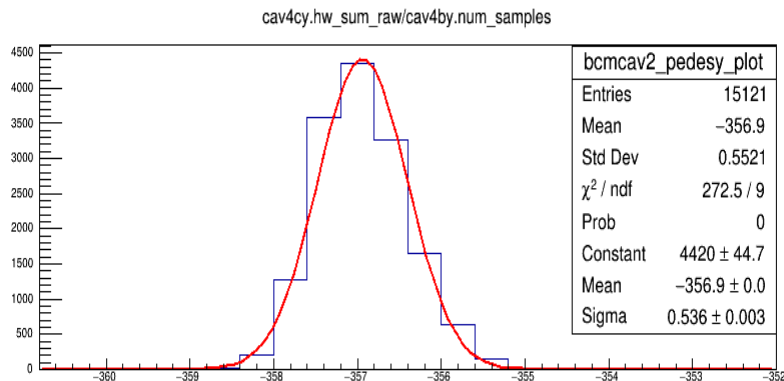
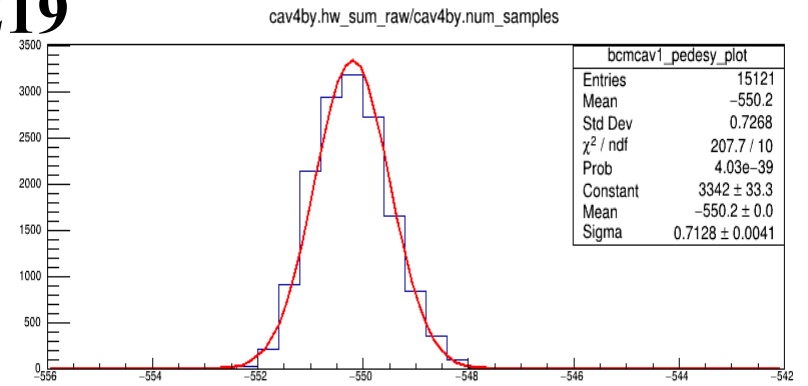
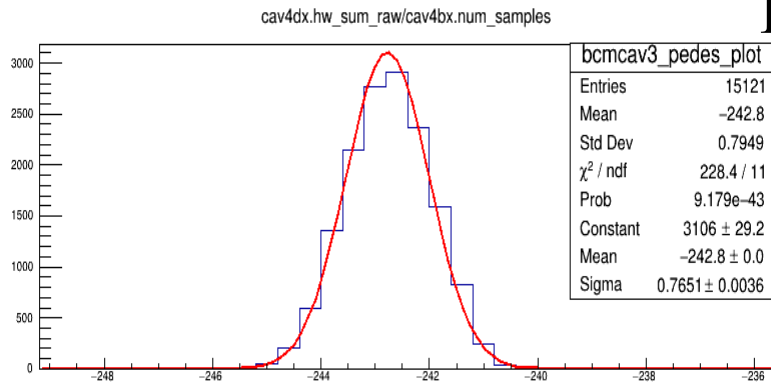
japan

Plots

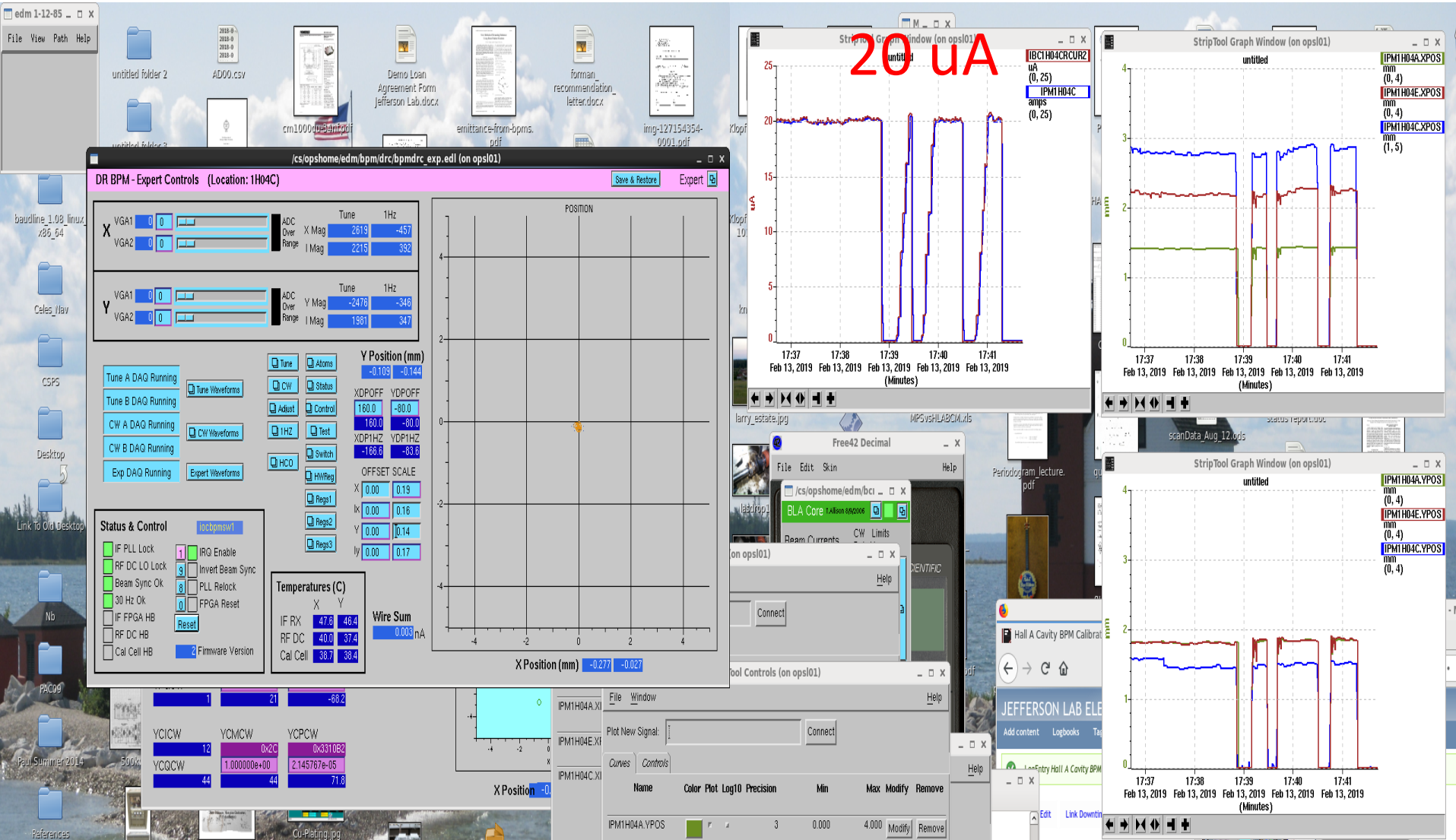
Beam Off Pedestal Correction



**Beam off
Run 1219**



Cavity BPMs Parasitic Calibration

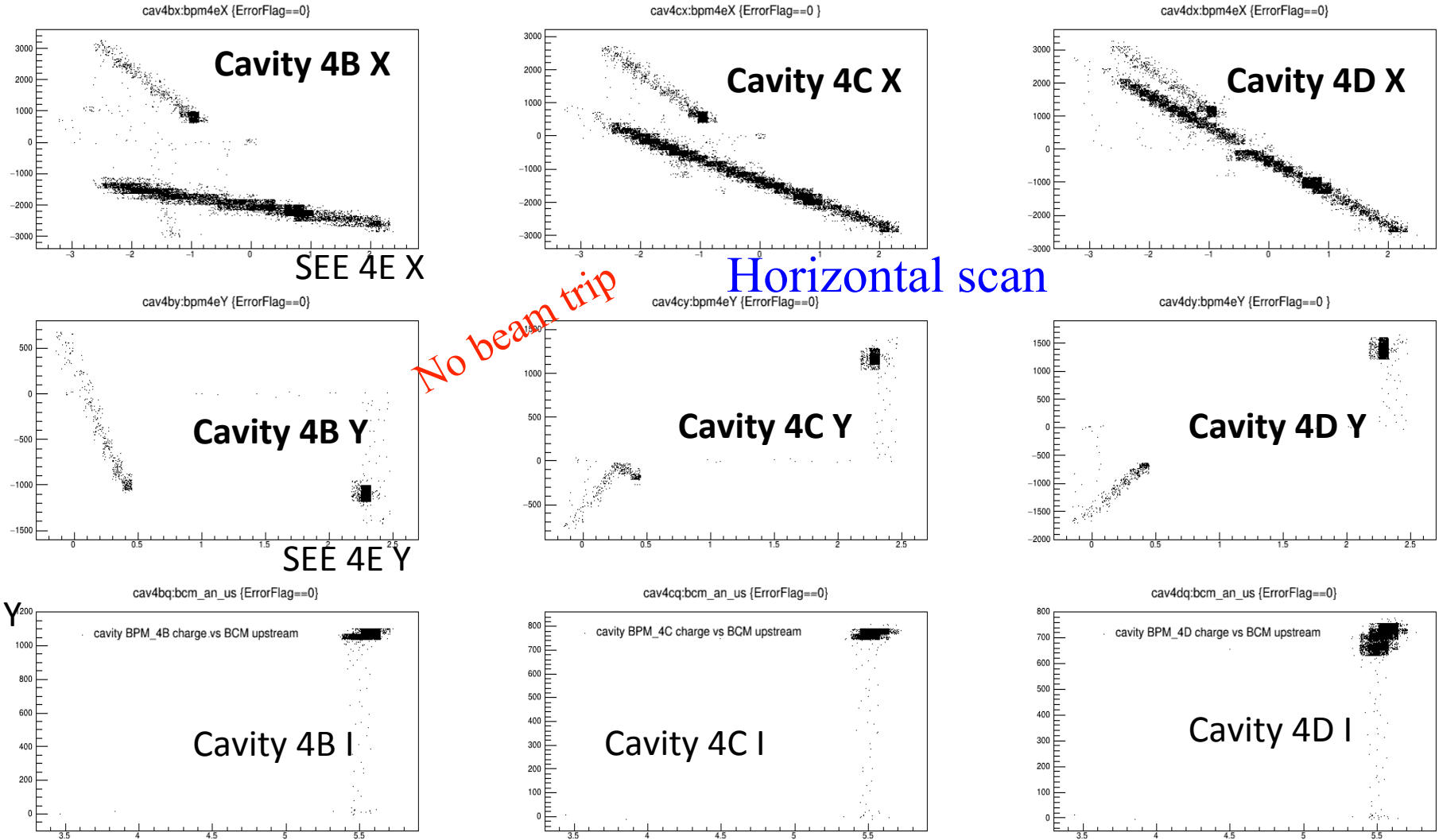


4B and 4C are done, after we satisfy the behavior, John will lock the parameter access.

Beam Tuning and Steering Test Runs

prexALL_1225.root

Raw signal without Calibration



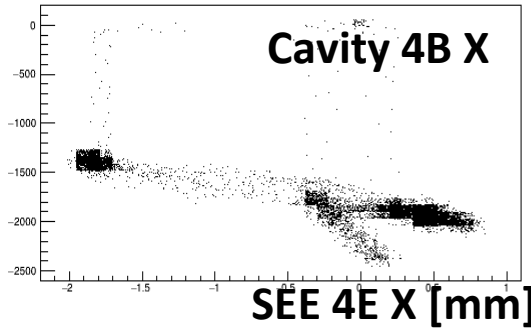
See the correlation between cavity and SEE BPMs

Beam Tuning and Steering Test Runs

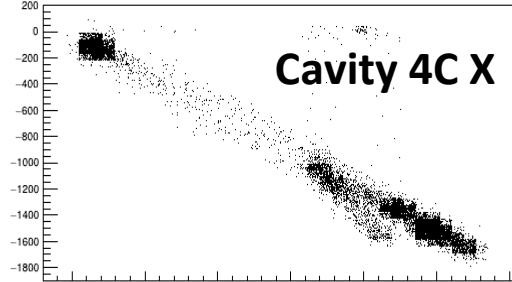
prexALL_1228.root

Raw signal without Calibration

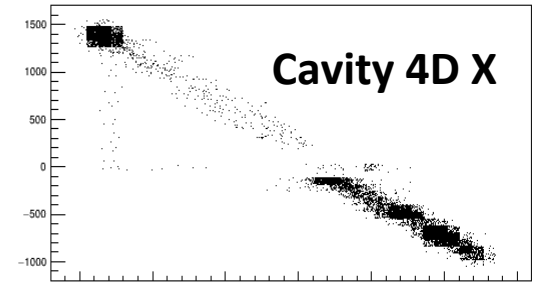
cav4bx:bpm4eX {ErrorFlag==0}



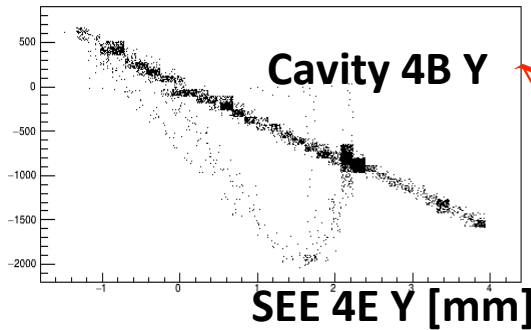
cav4cx:bpm4eX {ErrorFlag==0 }



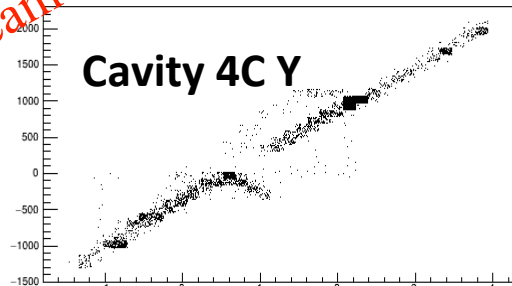
cav4dx:bpm4eX {ErrorFlag==0}



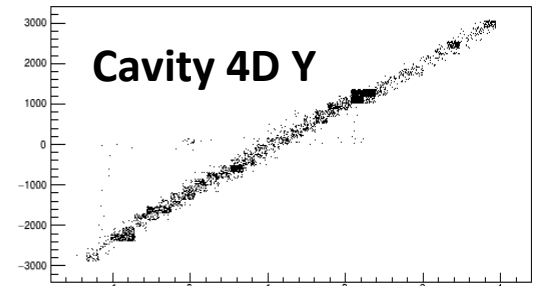
cav4by:bpm4eY {ErrorFlag==0}



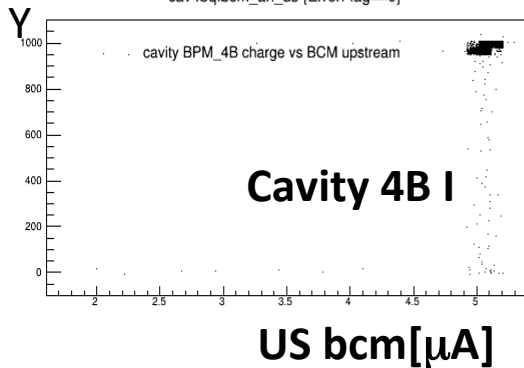
cav4cy:bpm4eY {ErrorFlag==0}



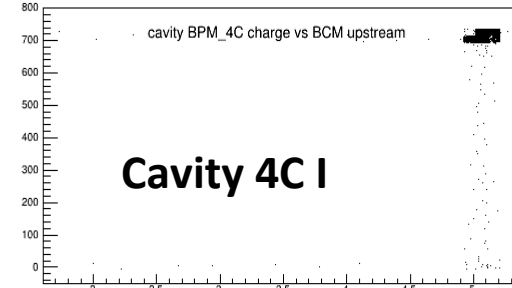
cav4dy:bpm4eY {ErrorFlag==0 }



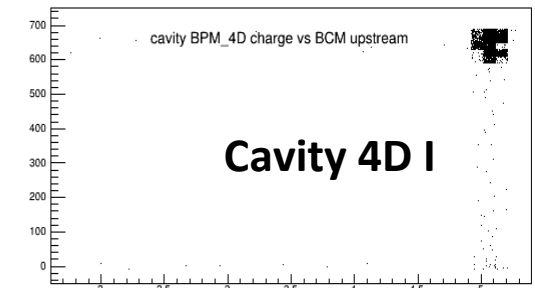
cav4bq:bcm_an_us {ErrorFlag==0}



cav4cq:bcm_an_us {ErrorFlag==0}



cav4dq:bcm_an_us {ErrorFlag==0}

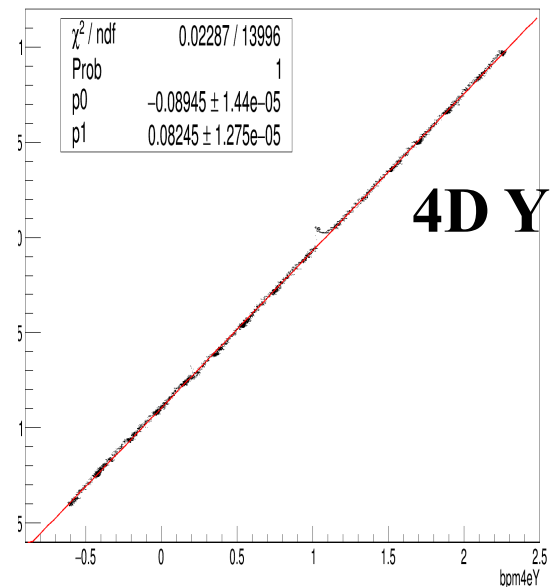
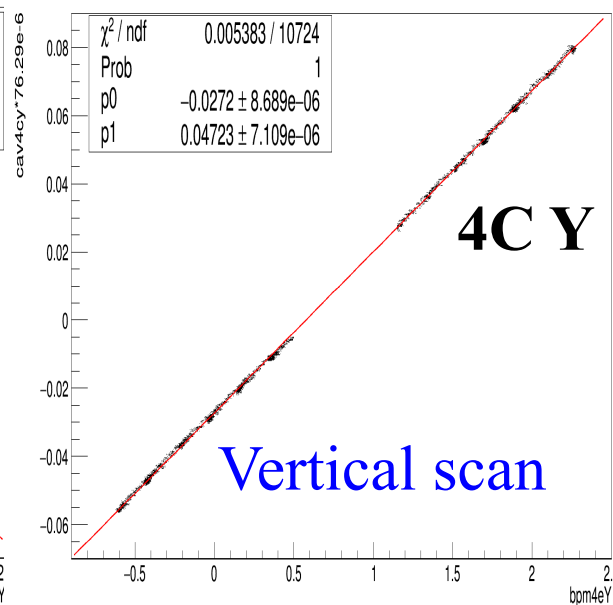
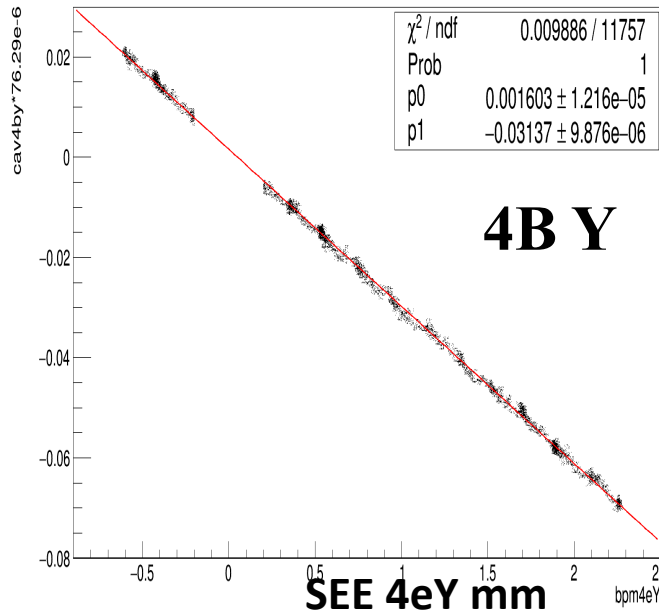
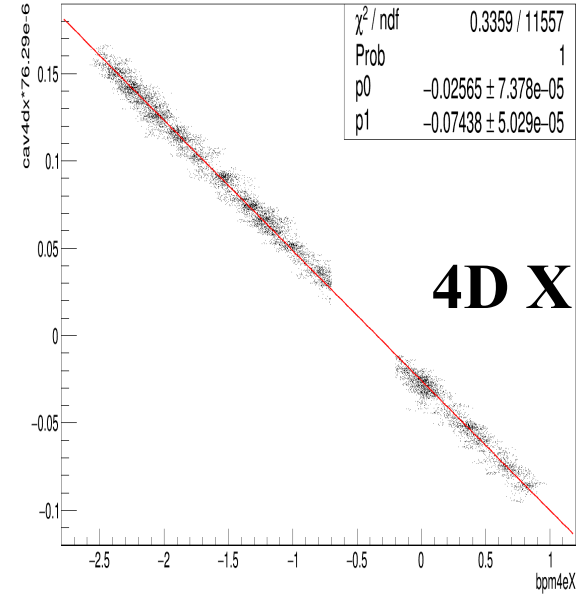
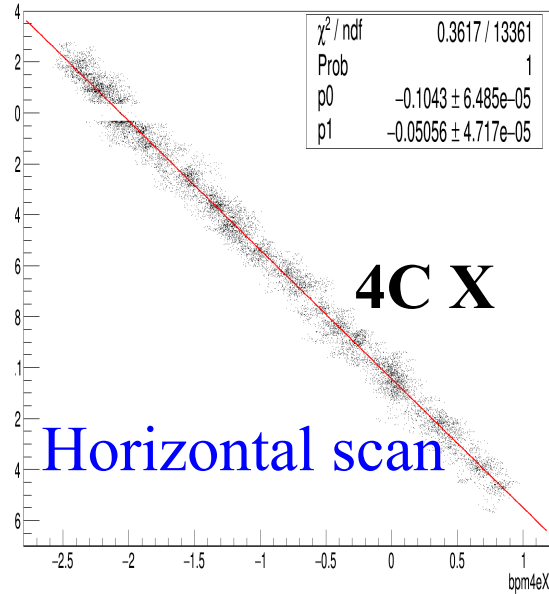
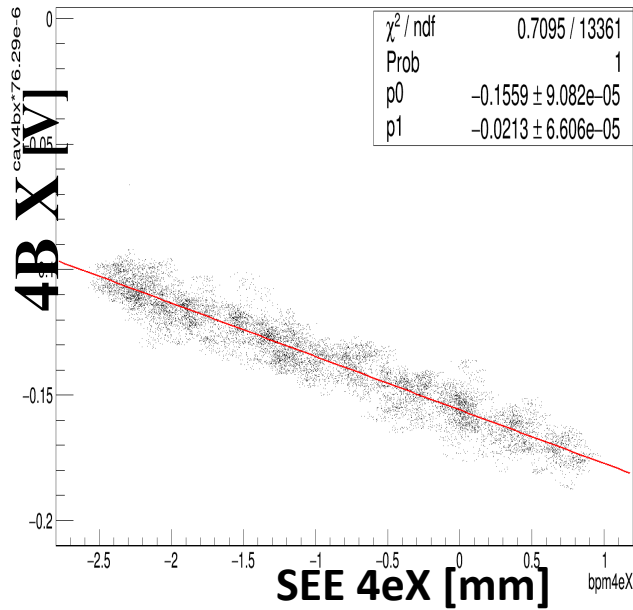


No beam trip

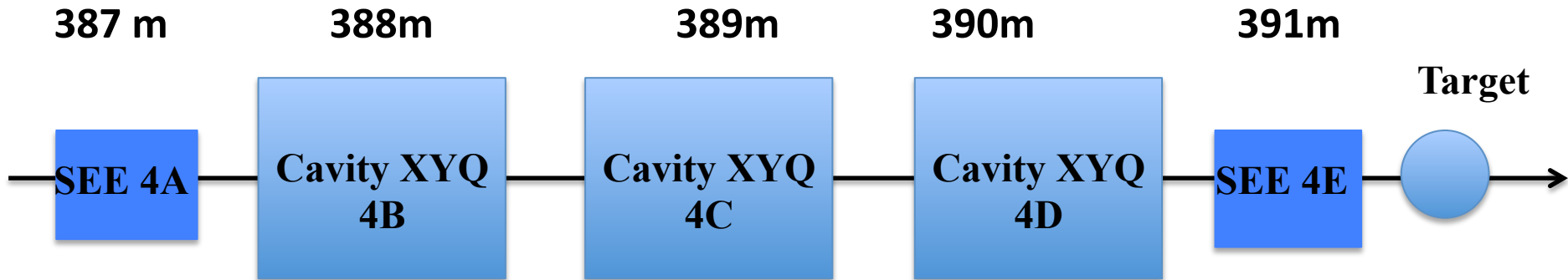
Vertical scan

See the correlation between cavity and SEE BPMs

Calibration for Cavity BPMs Signals



Cavity BPMs Position Calibration

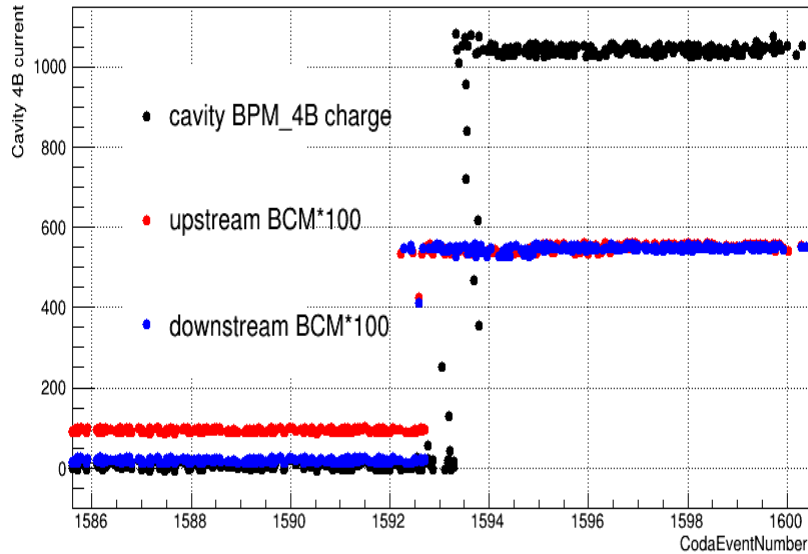


Position corrected

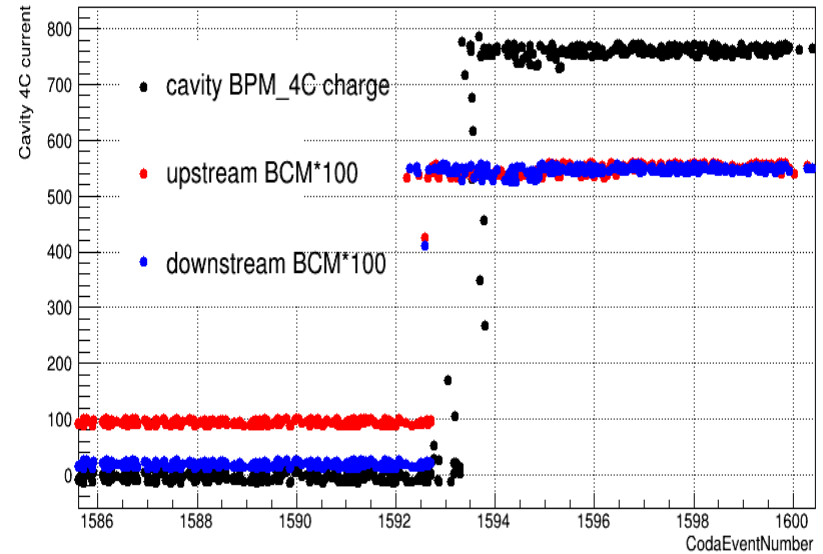
Cavity	X V/mm	Y V/mm
4B	0.0852	0.1254
4C	0.1011	0.0944
4D	0.0991	0.1099

Signal Delay Issues

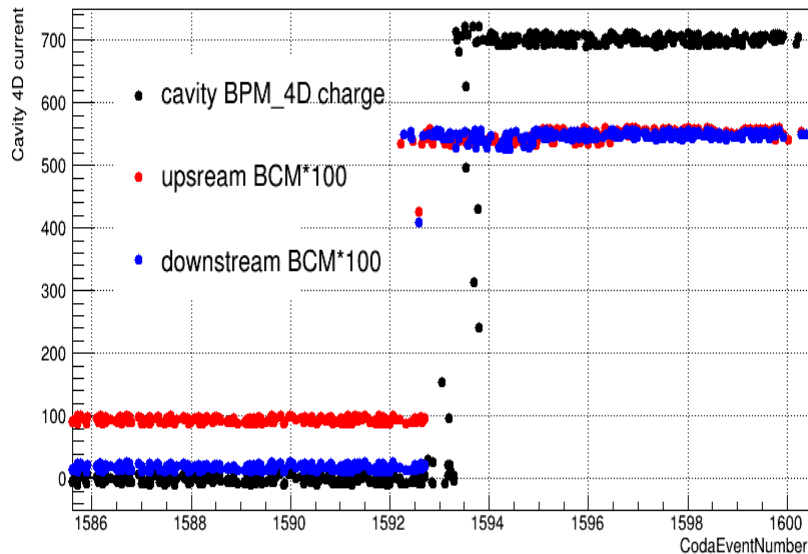
cav4bq:CodaEventNumber/30 (CodaEventNumber>47400 && CodaEventNumber<48000)



cav4cq:CodaEventNumber/30 (CodaEventNumber>47400 && CodaEventNumber<48000)



cav4dq:CodaEventNumber/30 (CodaEventNumber>47400 && CodaEventNumber<48000)



1 second delay $\longrightarrow$ trouble

Group Delay $\approx 1/BW$

Current receiver frame setting:
BW=1Hz

$$T_{\text{settle}} = 100\mu\text{s} - 500\mu\text{s}$$

BW = 10kHz?

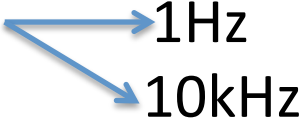
Cavity BPMs Milestone

Low current
beam centering
is achieved

Analog Output with 1Hz WB is working



1 week is confirmed with John

Analog Output with WB 



Before Prex II ?

Digital Output with fiber

Paul King will talk to Evan about this

Discussion and Outlook

- Send the required BW and position calibration factors v/mm to John by this afternoon.
-----applying the calibration factor to japan
- 1 Week Parasitic APEX beam time to test John's new cavity BPMs receiver frame.
-----10kHz BW delay time and the switch ability.
- Complete low current cavity BPMs beam test?
----- with the new receiver frame

Thank you !

Thanks to John, Chad, Bob, Paul King, and
.....

Back Up

Typical Analog Superhet Receiver

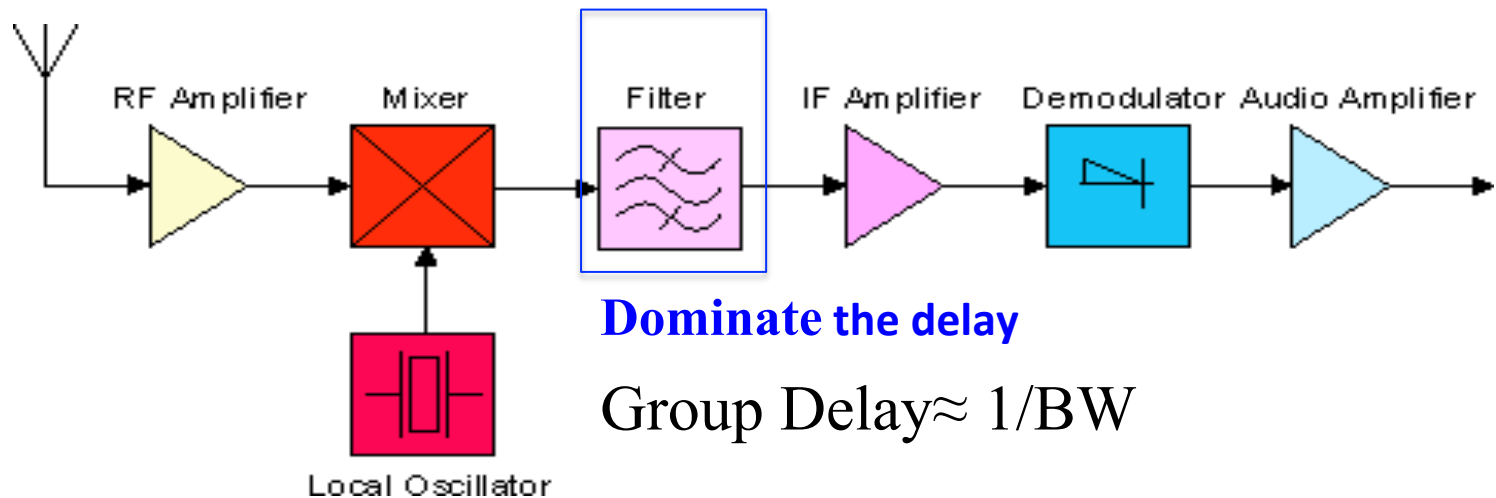
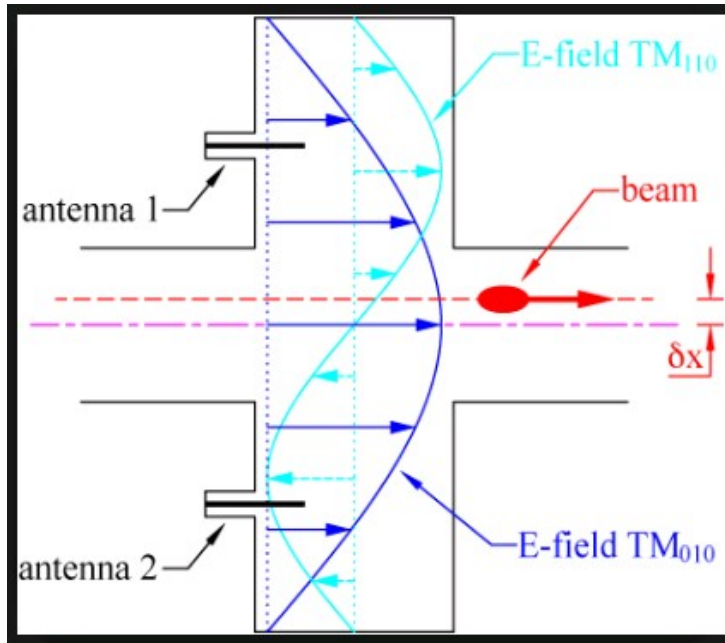
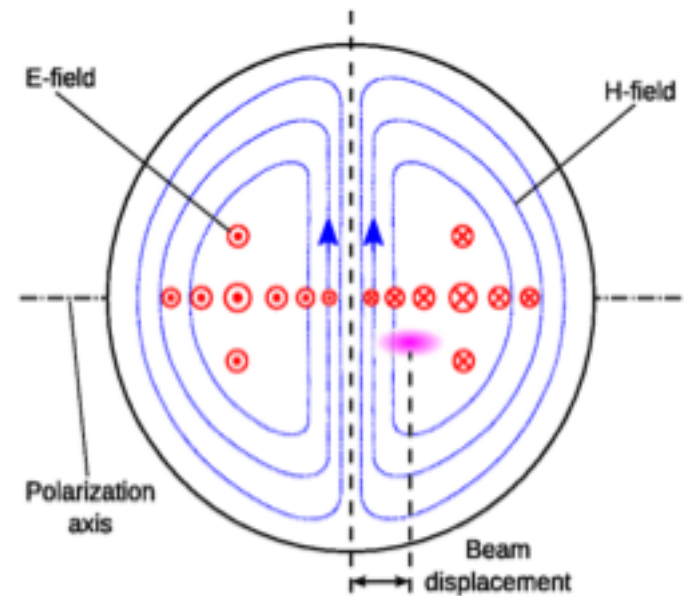
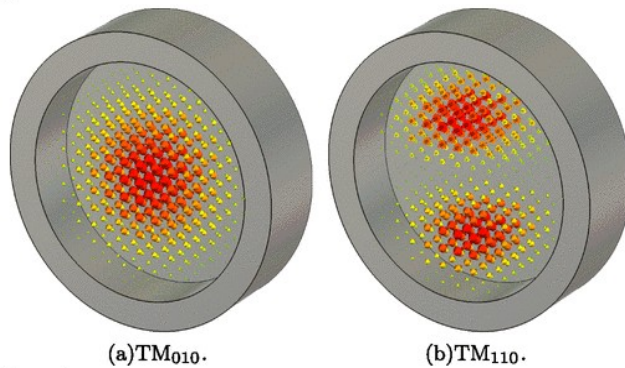


Figure 1. Functional block diagram of a basic superhet receiver, describing major subsystems.

Cavity Modes



- TM_{010} is the mode for I
- TM_{110} is the mode for X/I and Y/I



New Hall A BCM Digital Readout

