

FONT meeting: Friday, March 11

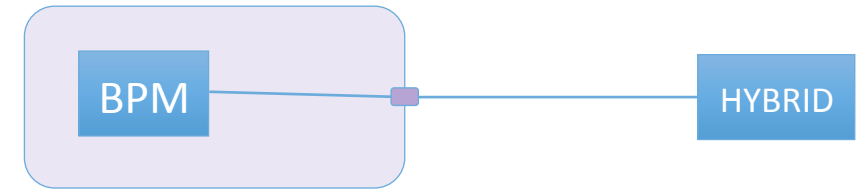
IPBPM alignment shift

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Outline

- IPBPM cable matching measurements (Monday set-up)
- Alignment study shift (Wednesday Owl)
- 30dB waveforms with beam steering to send the beam through all three IP BPMs.

IP BPM cable matching

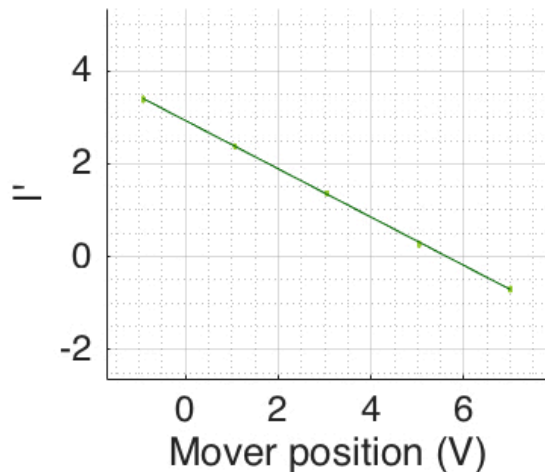


- TDR measurements previously showed mismatching of up to 3.8 mm in Y, and 13 mm in X.
- Re-paired cables to try and match within 10% of the wavelength (3.7 mm in Y, and 4.2 mm in X).
- TDR repeated on Monday with help from Naito-san. Now matched within 2.4 ± 0.8 mm in both X and Y.

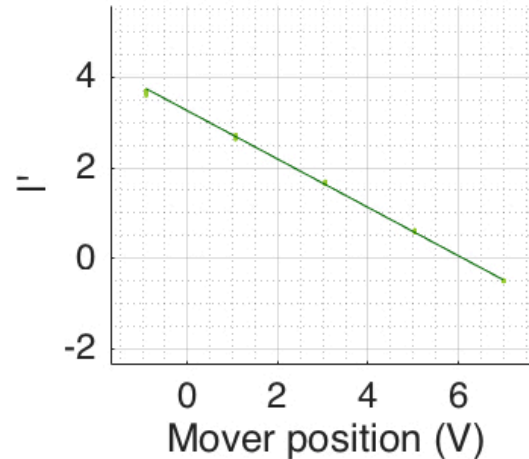
BPM	Port connection	Measured by TDR		Cavity to hybrid (m)	Error (m)	Δ Length (mm)	Error (mm)
		Mean (ns)	Error (ns)				
IPAY	IPA-Y1	70.820	0.005	2.341	0.006	2.4	0.8
	IPA-Y2	70.840	0.005	2.343	0.006		
IPBY	IPB-Y1	71.780	0.005	2.455	0.006	2.4	0.8
	IPB-Y2	71.800	0.005	2.457	0.006		
IPCY	IPC-Y1	70.840	0.005	2.343	0.006	1.2	0.8
	IPC-Y2	70.850	0.005	2.344	0.006		
IPAX	IPA-X1	71.780	0.005	2.455	0.006	1.2	0.8
	IPA-X2	71.790	0.005	2.456	0.006		
IPBX	IPB-X2	71.780	0.005	2.455	0.006	1.2	0.8
	IPB-X1	71.770	0.005	2.454	0.006		
IPCX	IPC-X1	71.780	0.005	2.455	0.006	1.2	0.8
	IPC-X2	71.790	0.005	2.456	0.006		

IP BPM alignment shift – Wednesday Owl

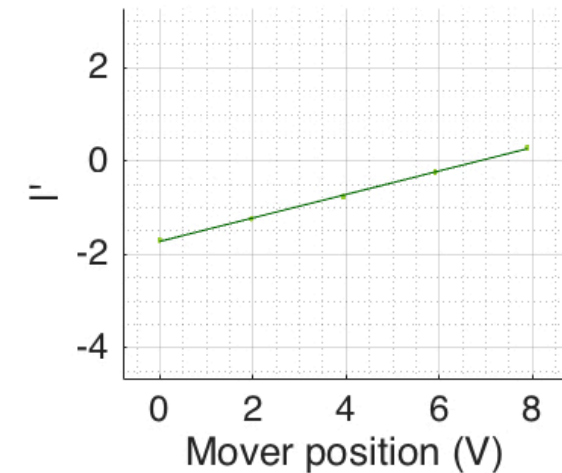
- Try to center the beam in all three BPMs using QD0FF mover position to steer the beam.
- Adjust phase shifters to maximise the position-dependence in the I-signal (and minimise position-dependence in Q-signal).
- Perform scans of the BPM mover positions to find a setting where I' signal = 0, i.e. BPM center.



IPAyCal8_30dB_ipbpm_160309



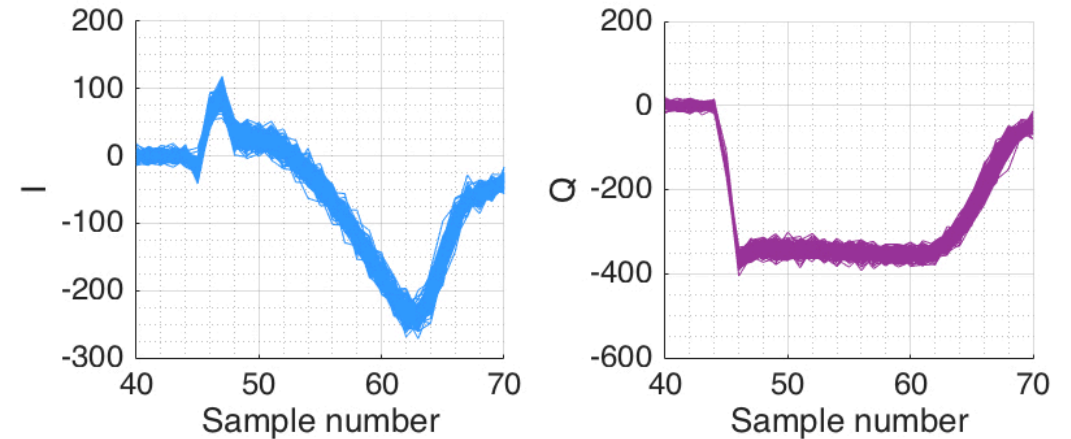
IPByCal8_30dB_ipbpm_160309



IPCyCal8_30dB_ipbpm_160309

Checking BPM center measurement

- Compare the apparent BPM center between two 180-degree phase-shifted measurements.
- Measure electronics offset to BPM center by suppressing dipole signal with 70dB attenuation.



BPM	Mean baseline position offset at 70 dB (um)	Difference in center position between two 180 degree phase shifted settings (um)
IPA	4.76 ± 0.04	13.5
IPB	0.10 ± 0.04	1
IPC	1.86 ± 0.06	6.3

- These offsets and differences are very small.
- Conclude we trust the BPM center position is approximately halfway between the two 180-degree phase shifted results.

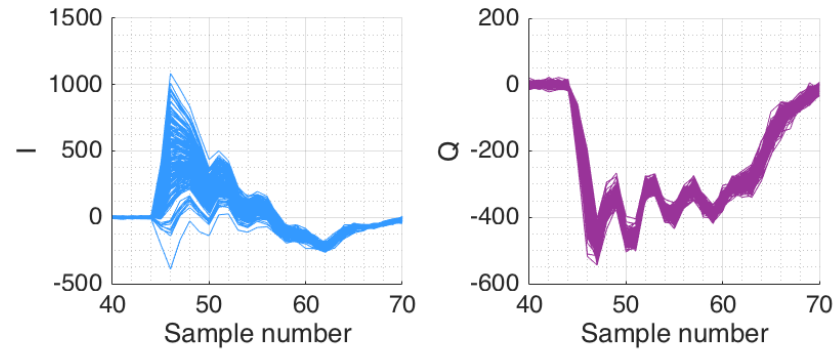
Beam centered in all three BPMs using **AQD0FF** of 10 um and **IPAB Mover: 6.0 V**, and **IPC Mover: 7.2 V**.

jitRun17_ipbpm_160309

Number of triggers: 201
Number of samples: 190
IPBPM analysed: AY
Waveform starts at sample: 45
Reference maximum at sample: 43
IQ maximum at sample: 47

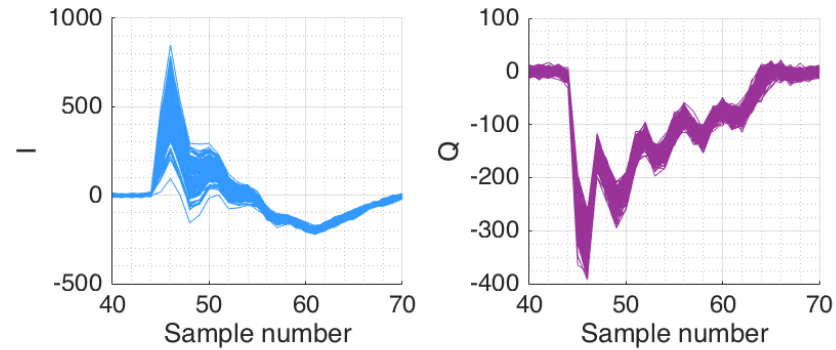
CHARGE
 $0.303 \pm 0.001 \times 10^{10}$

- Waveforms at 30dB attenuation.
Beam waist at nominal IP.



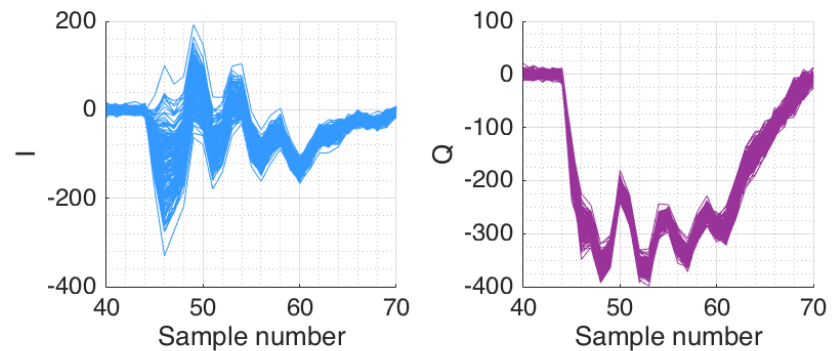
SAMPLING
Samples 47 to 50
Integration
Reference sample number: 44

POSITION
Position Mean: -40 ± 1
Jitter: 15.8 ± 0.7



SAMPLING
Samples 47 to 50
Integration
Reference sample number: 44

POSITION
Position Mean: -19.4 ± 0.5
Jitter: 8.1 ± 0.4



SAMPLING
Samples 47 to 50
Integration
Reference sample number: 44

POSITION
Position Mean: 24.8 ± 0.7
Jitter: 10.6 ± 0.5