

Preliminary resolution study results

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Introduction

- Results from 31st October for:
 - IPB to IPC interpolation
 - Two electronics on one BPM study

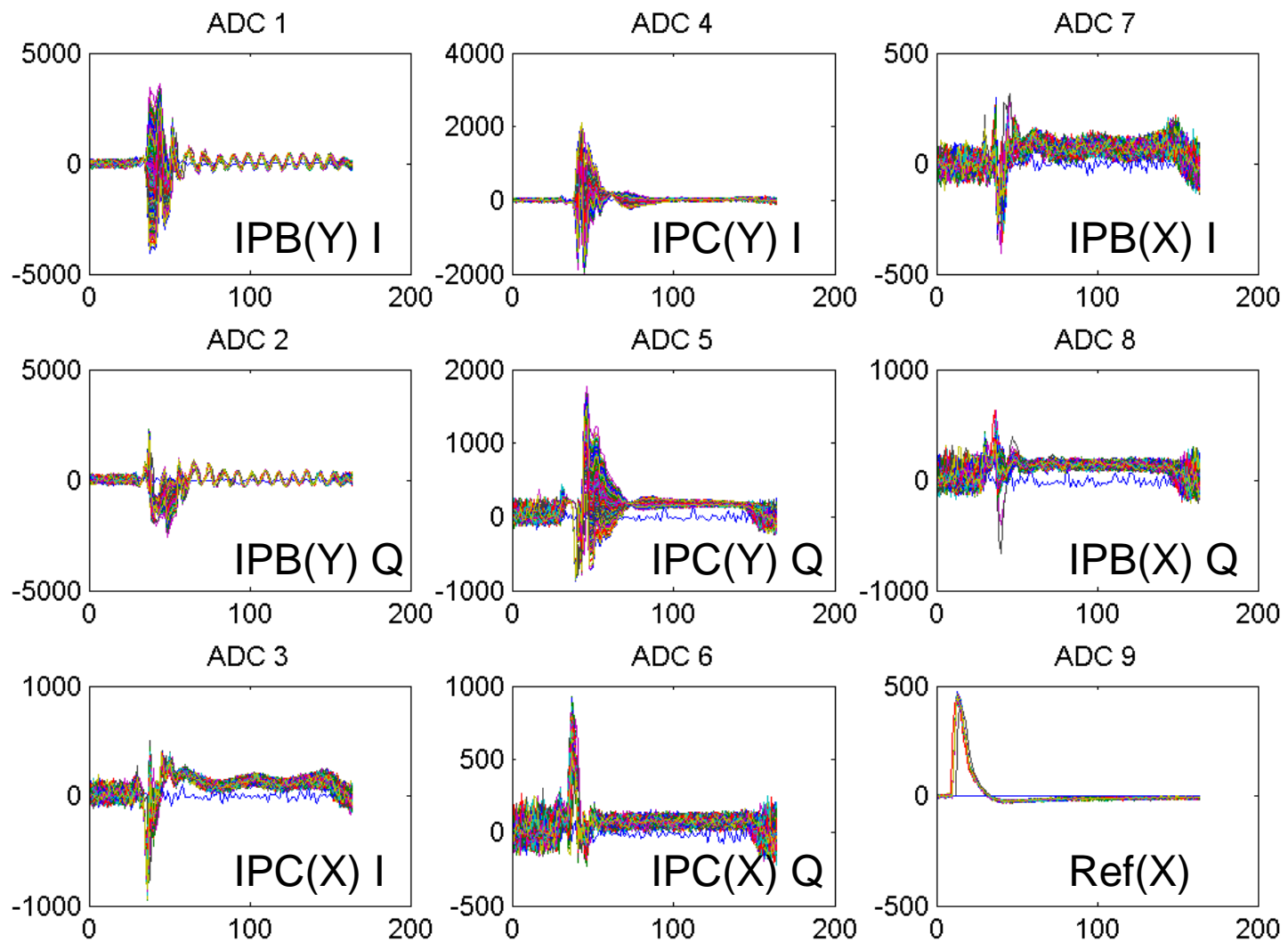
IPB to IPC interpolation

- Take jitter run at start of shift with no change to optics other than to steer beam through both IPB and IPC in both x and y
- Then later calibrate with waist in x and y at each of IPB and IPC
- Jitter runs and calibrations taken at 0 dB to 50 dB

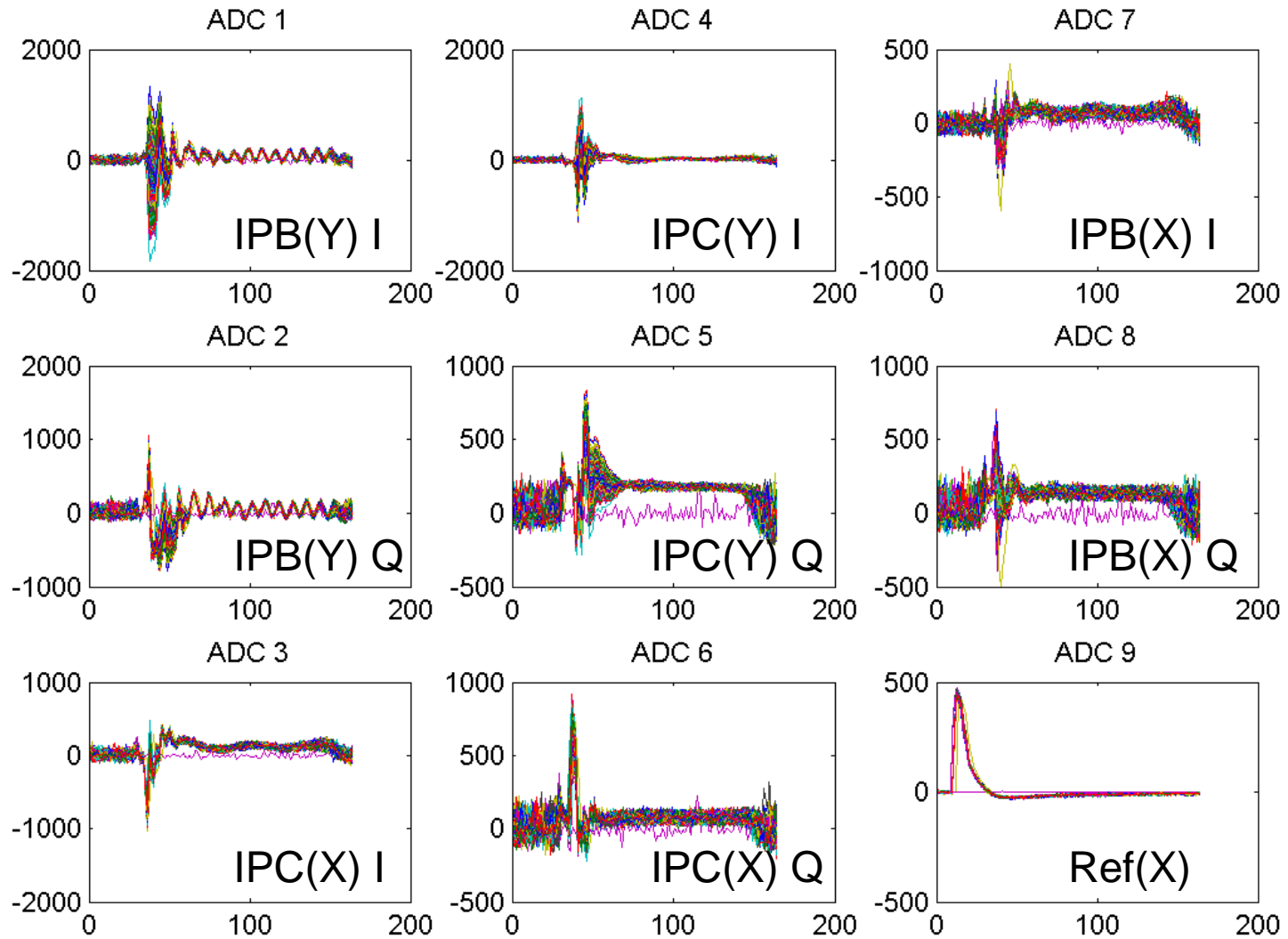
IPB to IPC interpolation

- Results:
 - Waveforms
 - IPB(Y) to IPC(Y) position correlation
 - Interpolated y paths from IPB to IPC
 - Interpolated x and y jitter from IPB to IPC

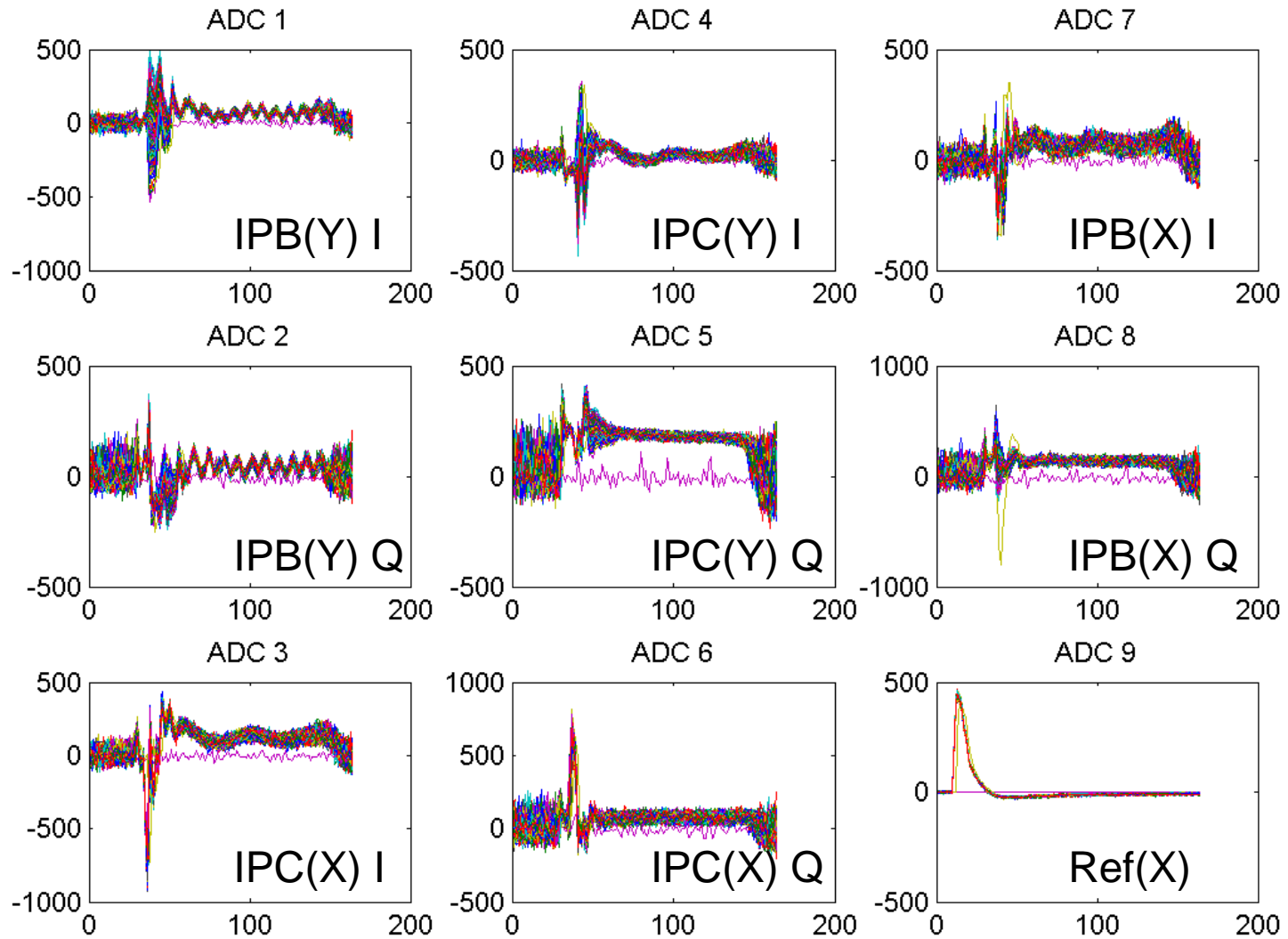
ADC waveforms for jitRun4_0dB_Board1_311014 on 311014



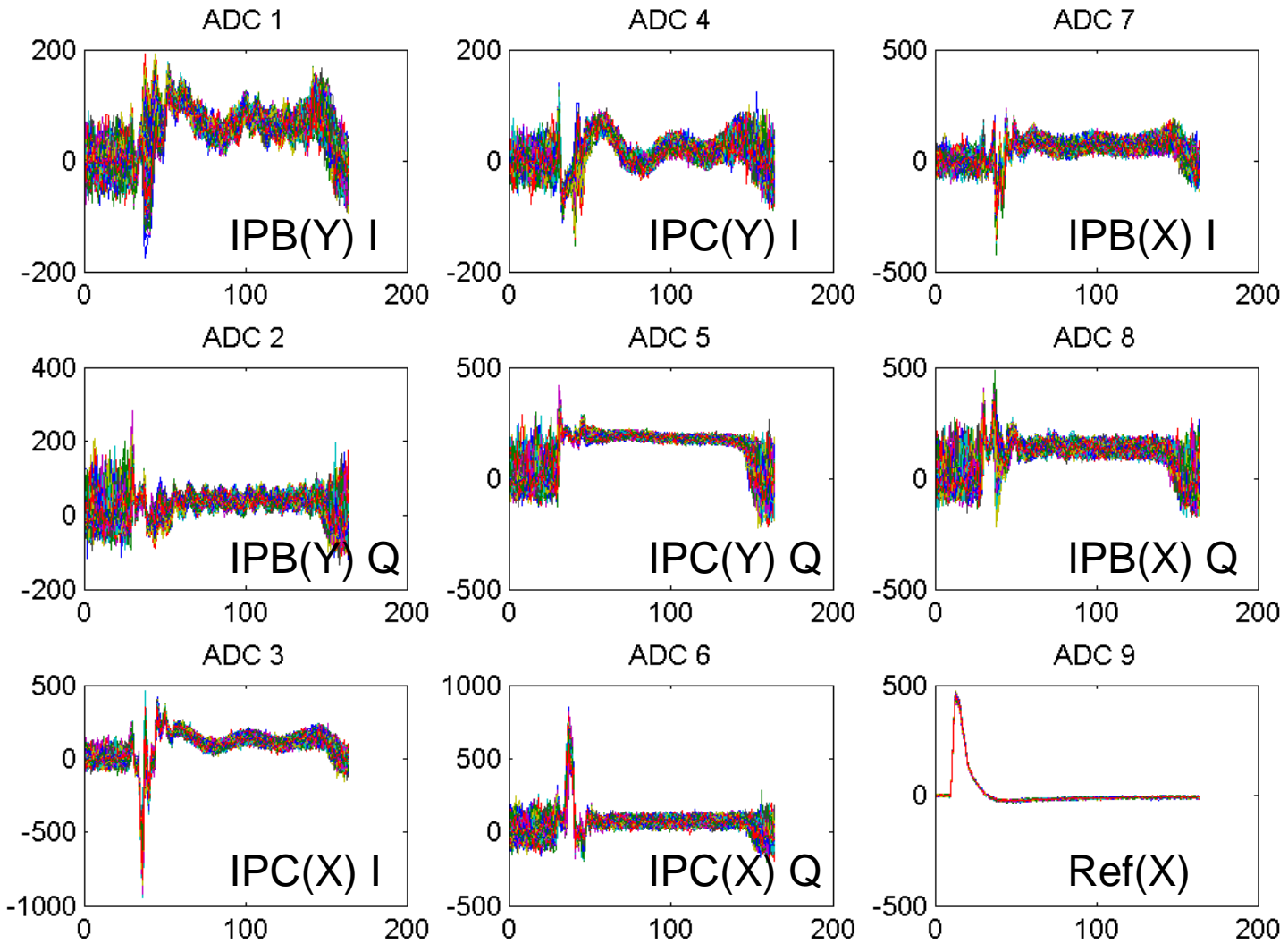
ADC waveforms for jitRun5_10dB_Board1_311014 on 311014



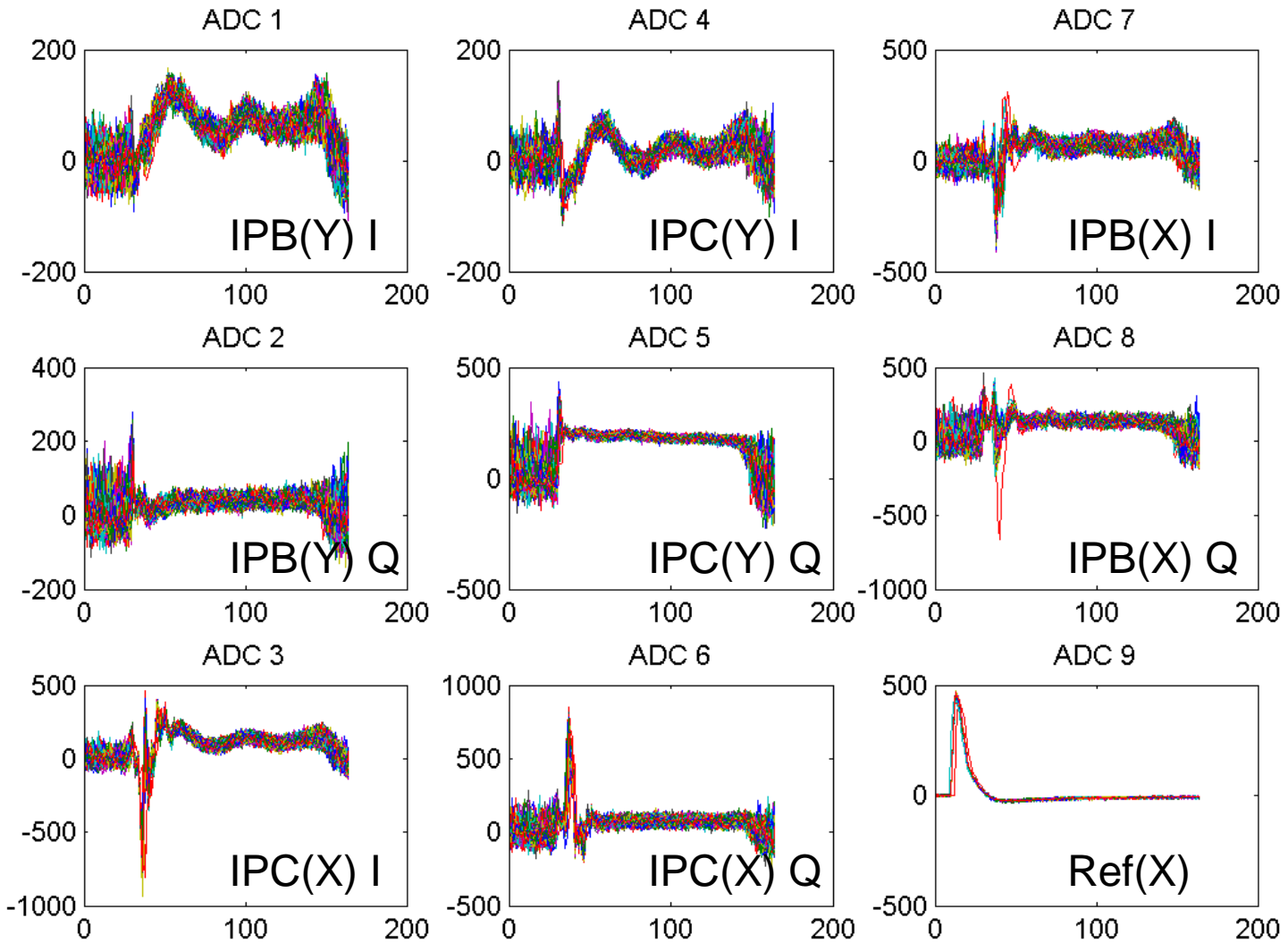
ADC waveforms for jitRun6_20dB_Board1_311014 on 311014



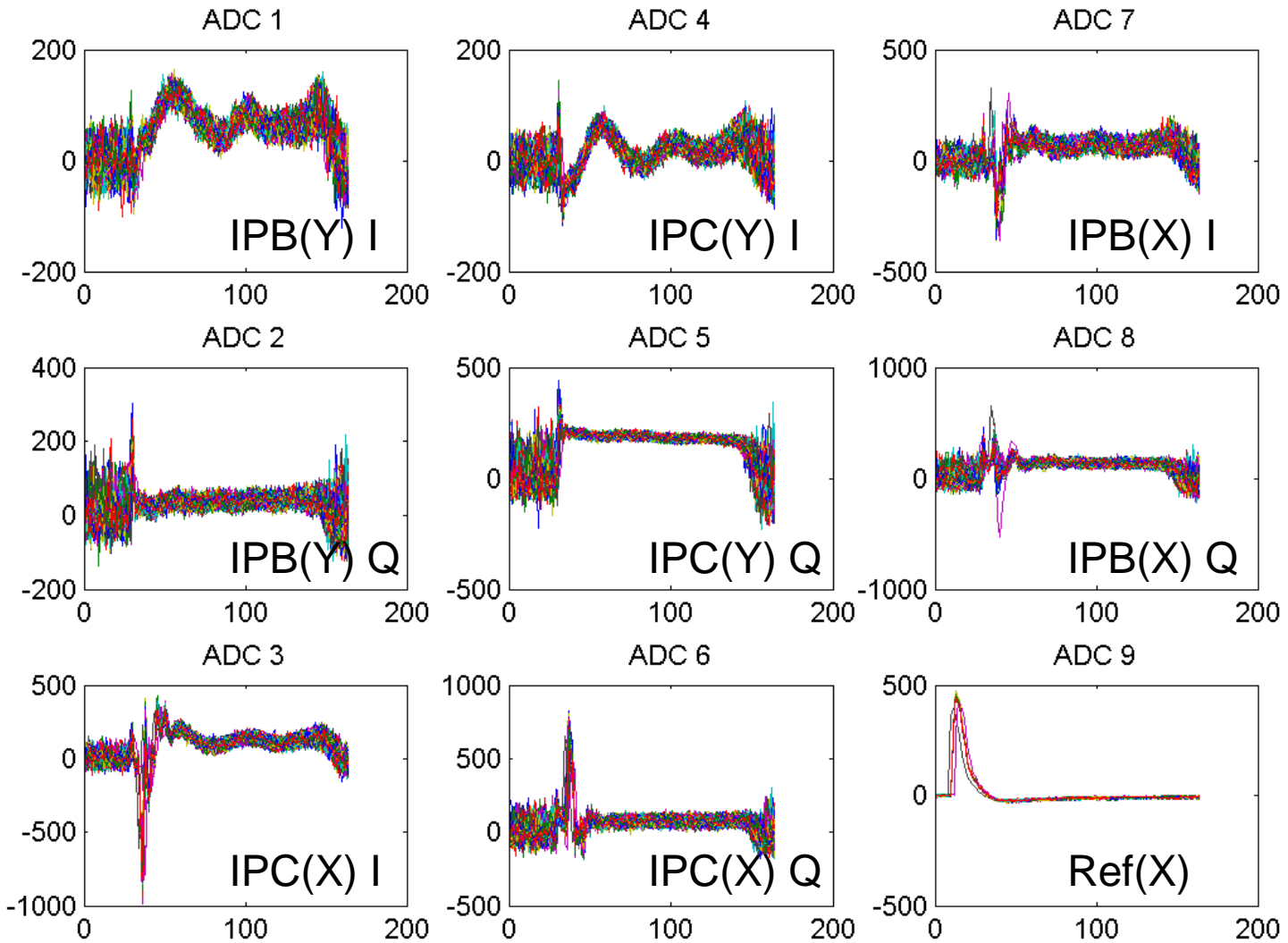
ADC waveforms for jitRun7_30dB_Board1_311014 on 311014



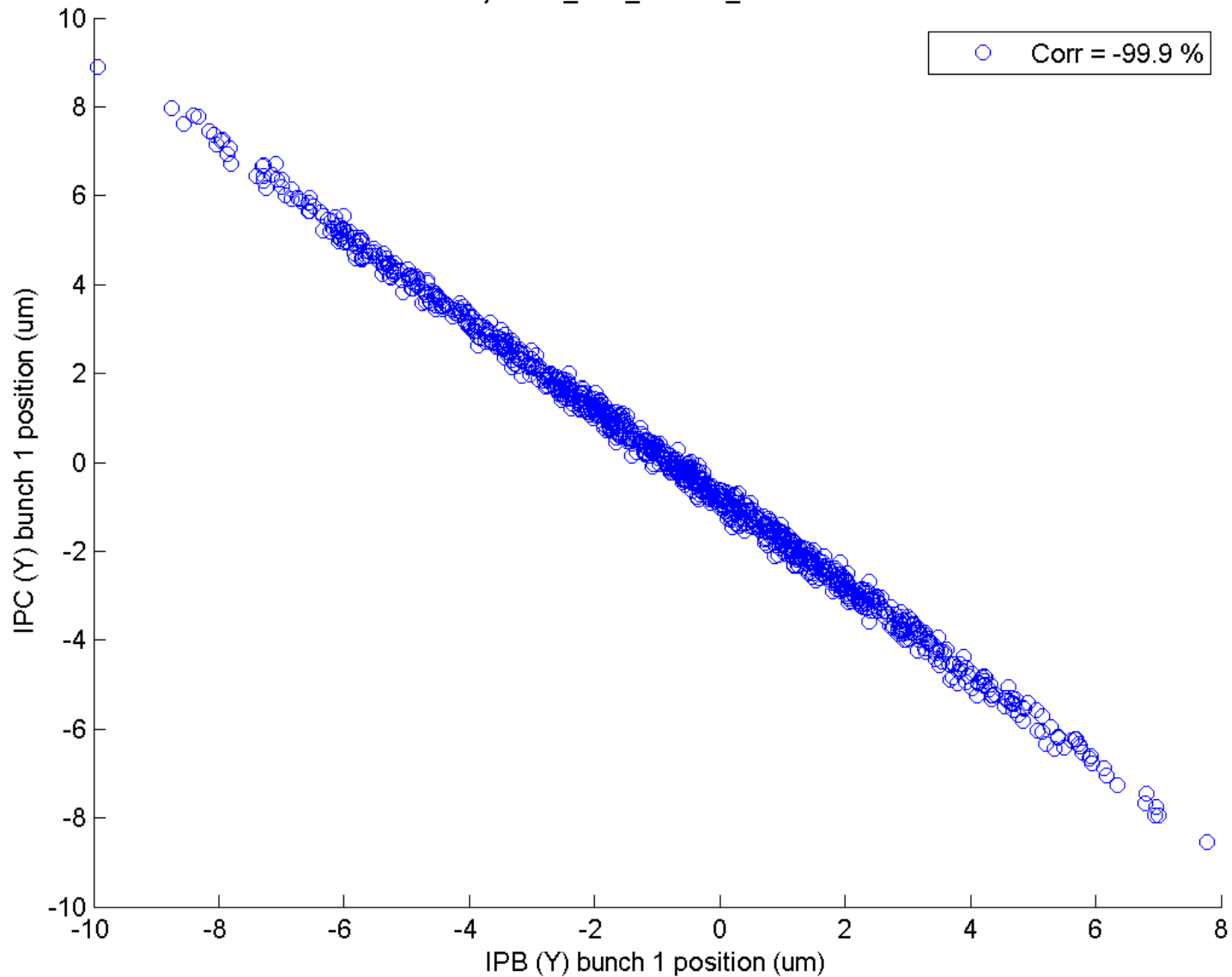
ADC waveforms for jitRun8_40dB_Board1_311014 on 311014

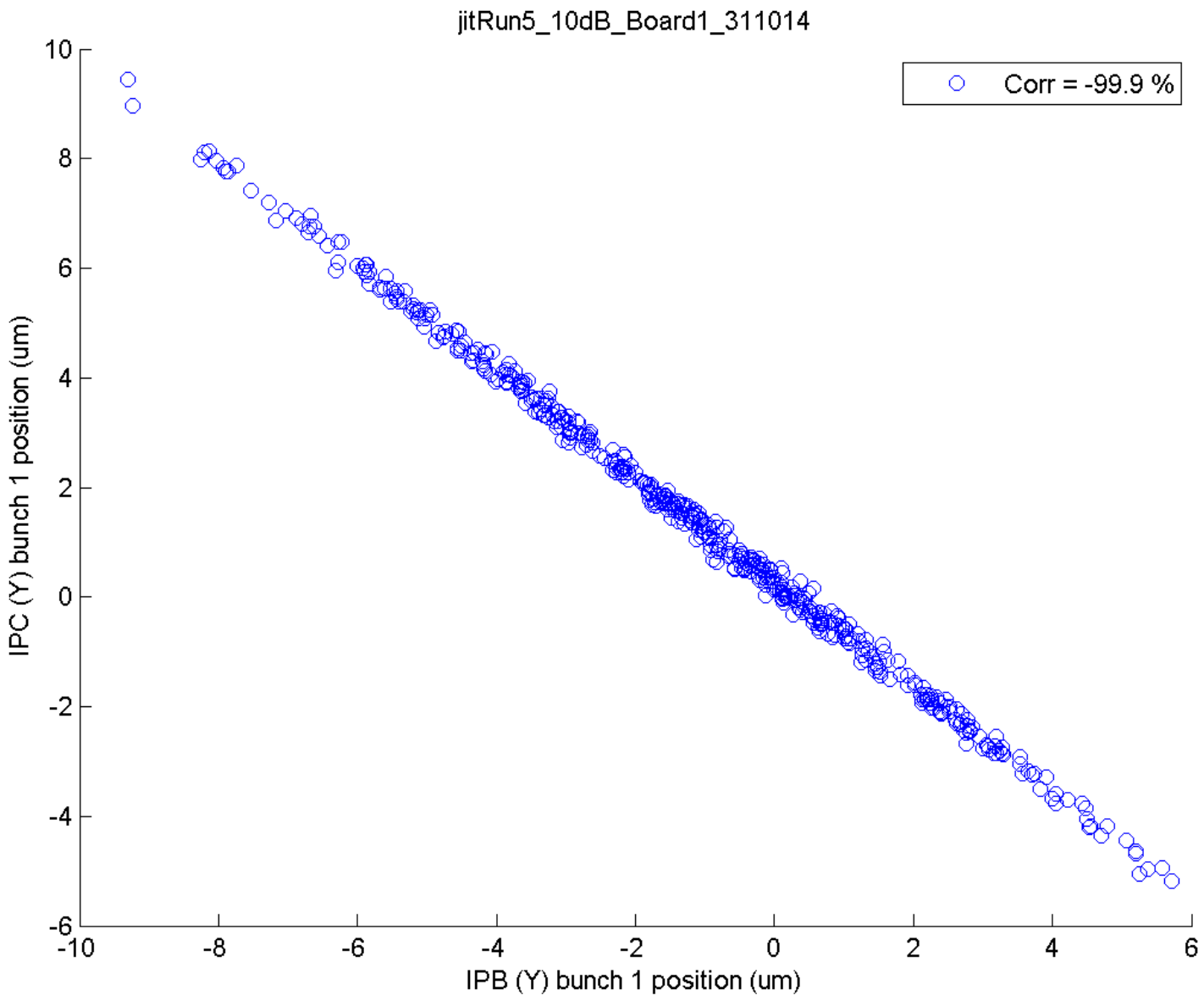


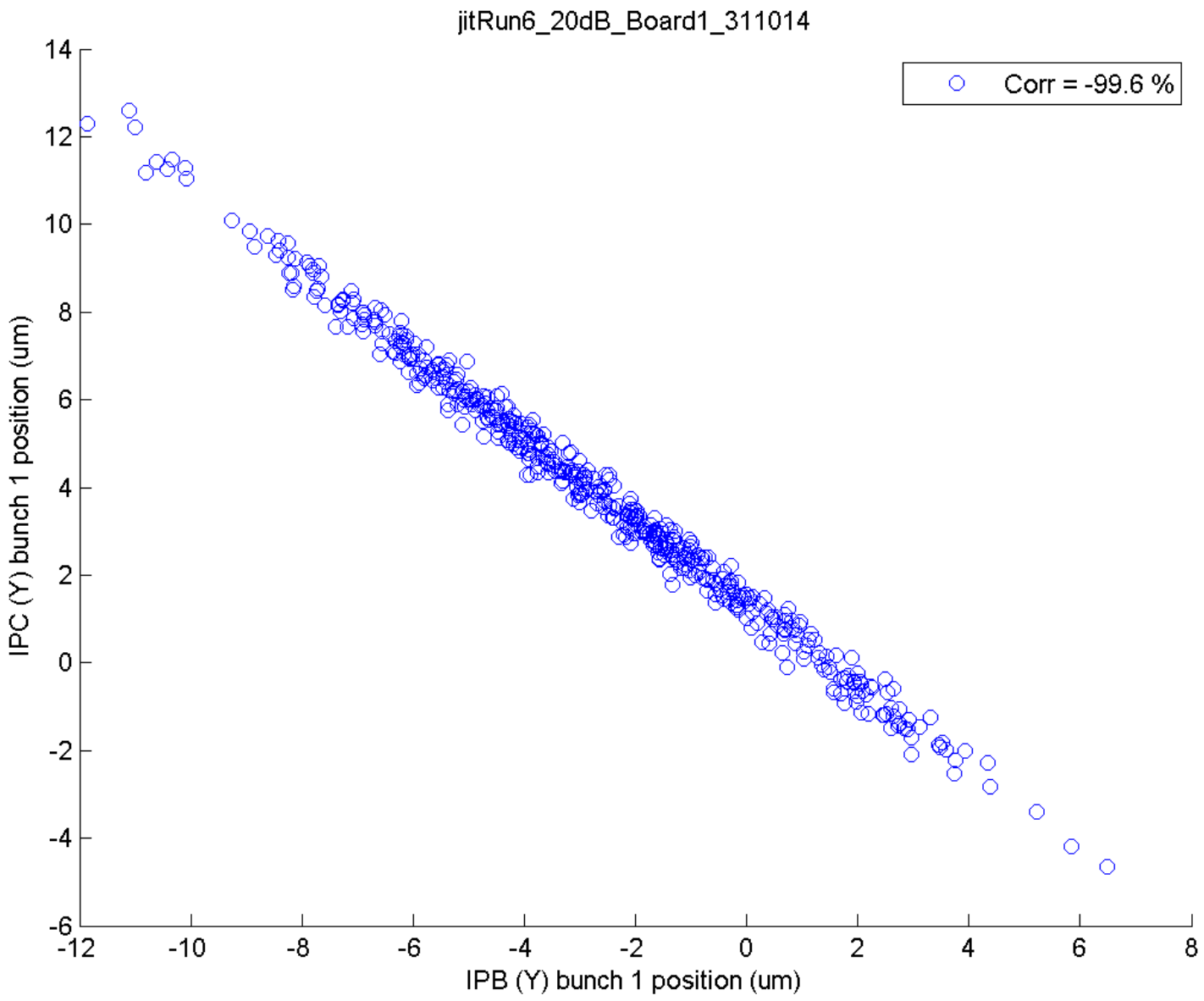
ADC waveforms for jitRun9_50dB_Board1_311014 on 311014

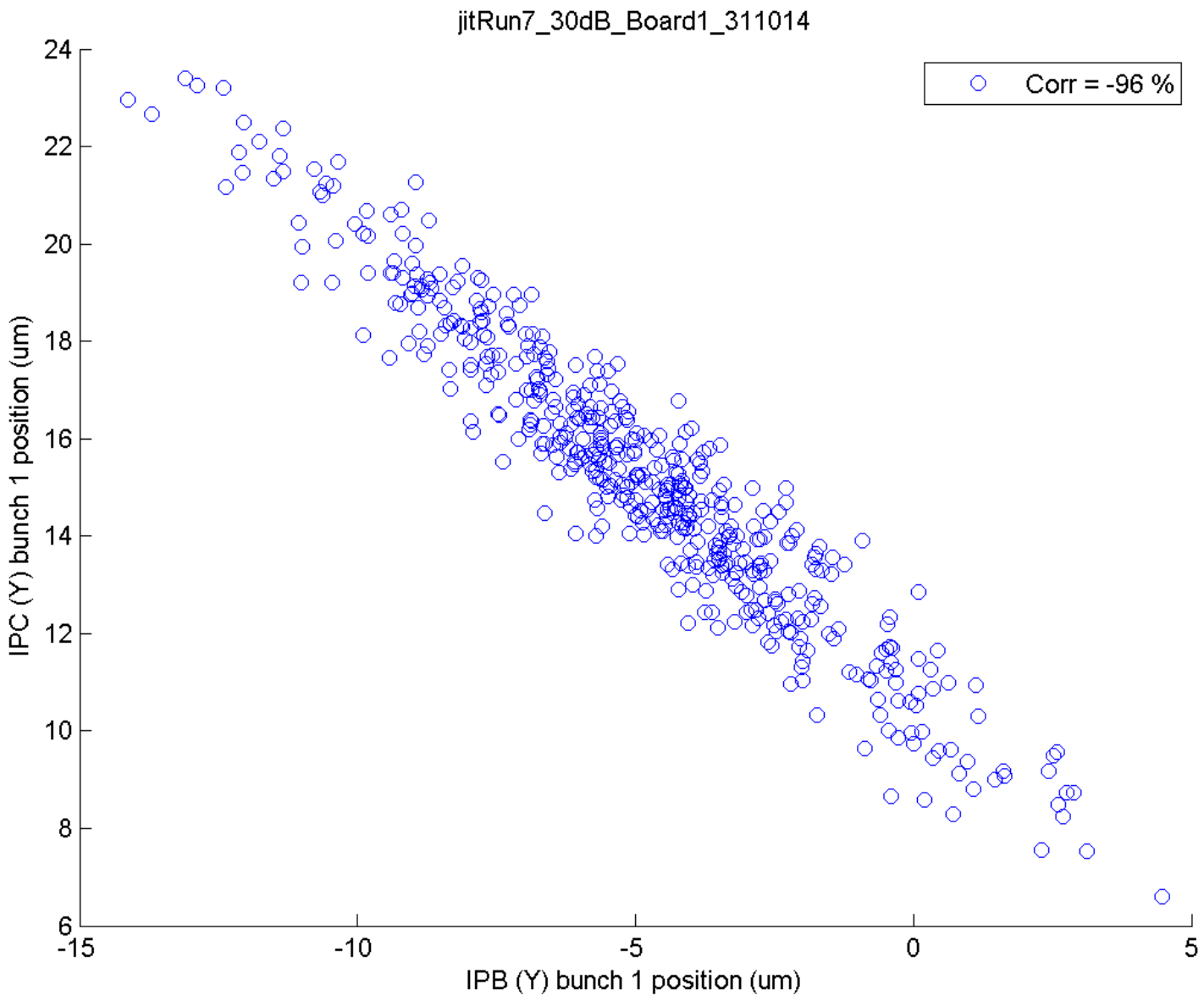


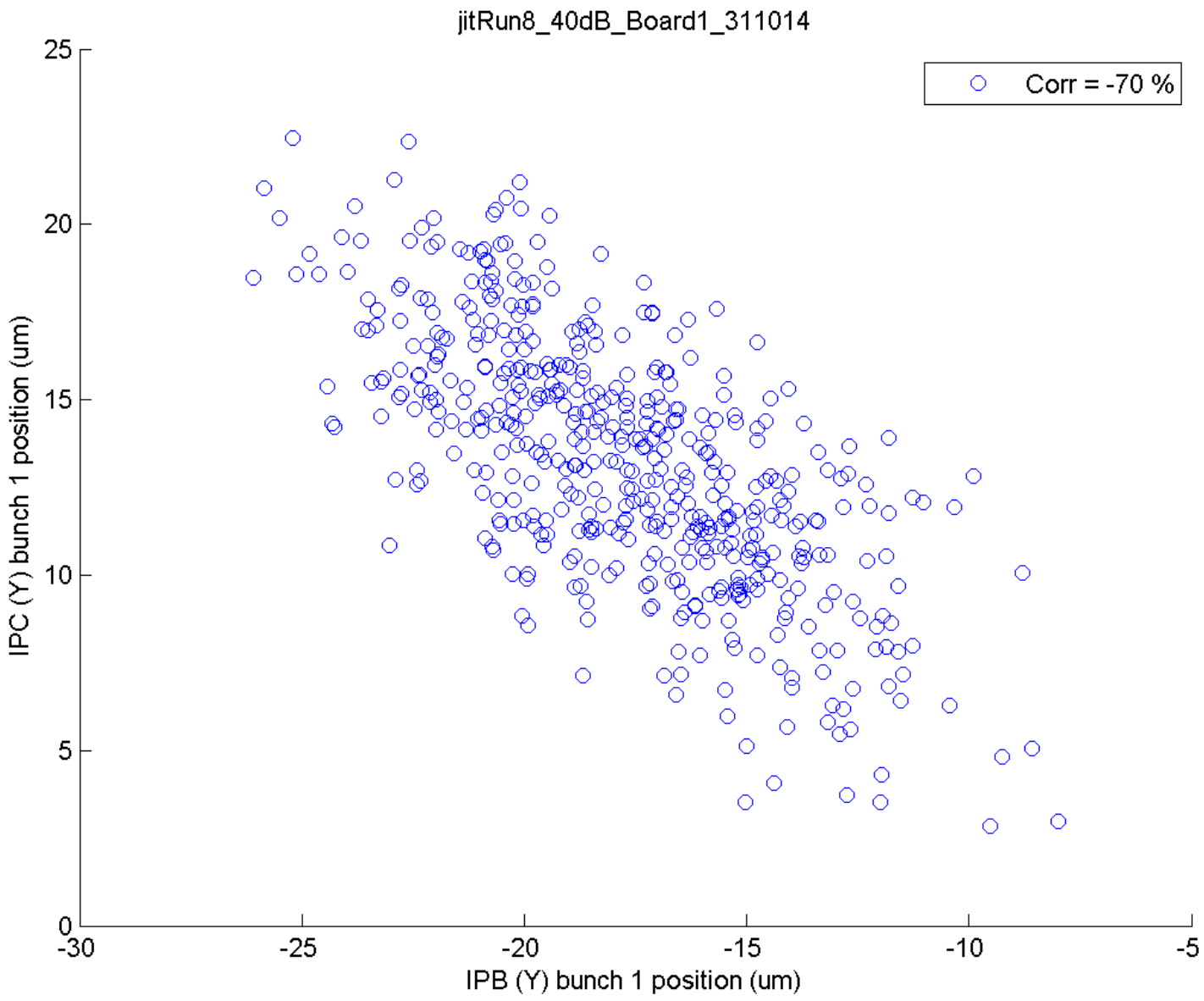
jitRun4_0dB_Board1_311014

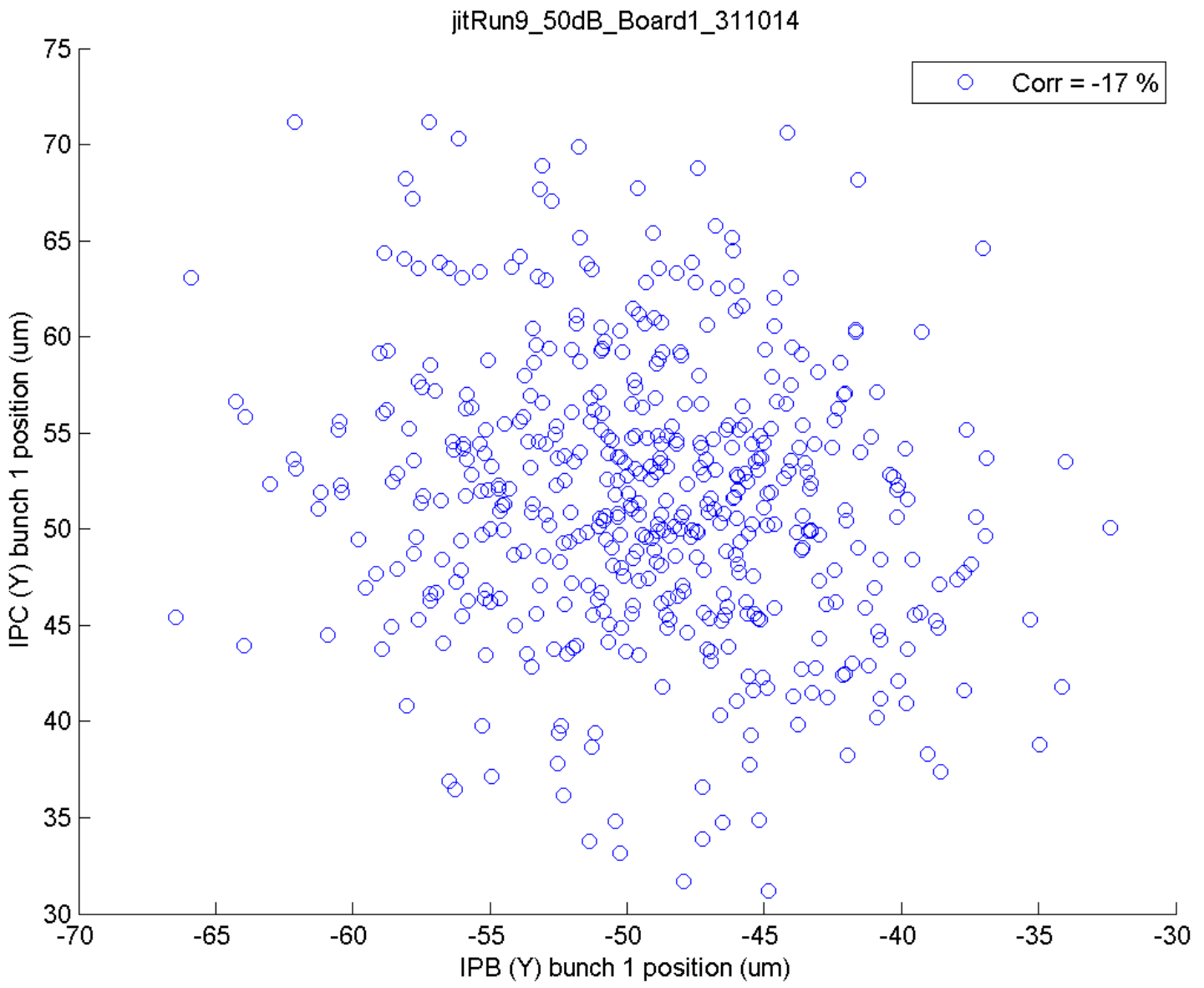




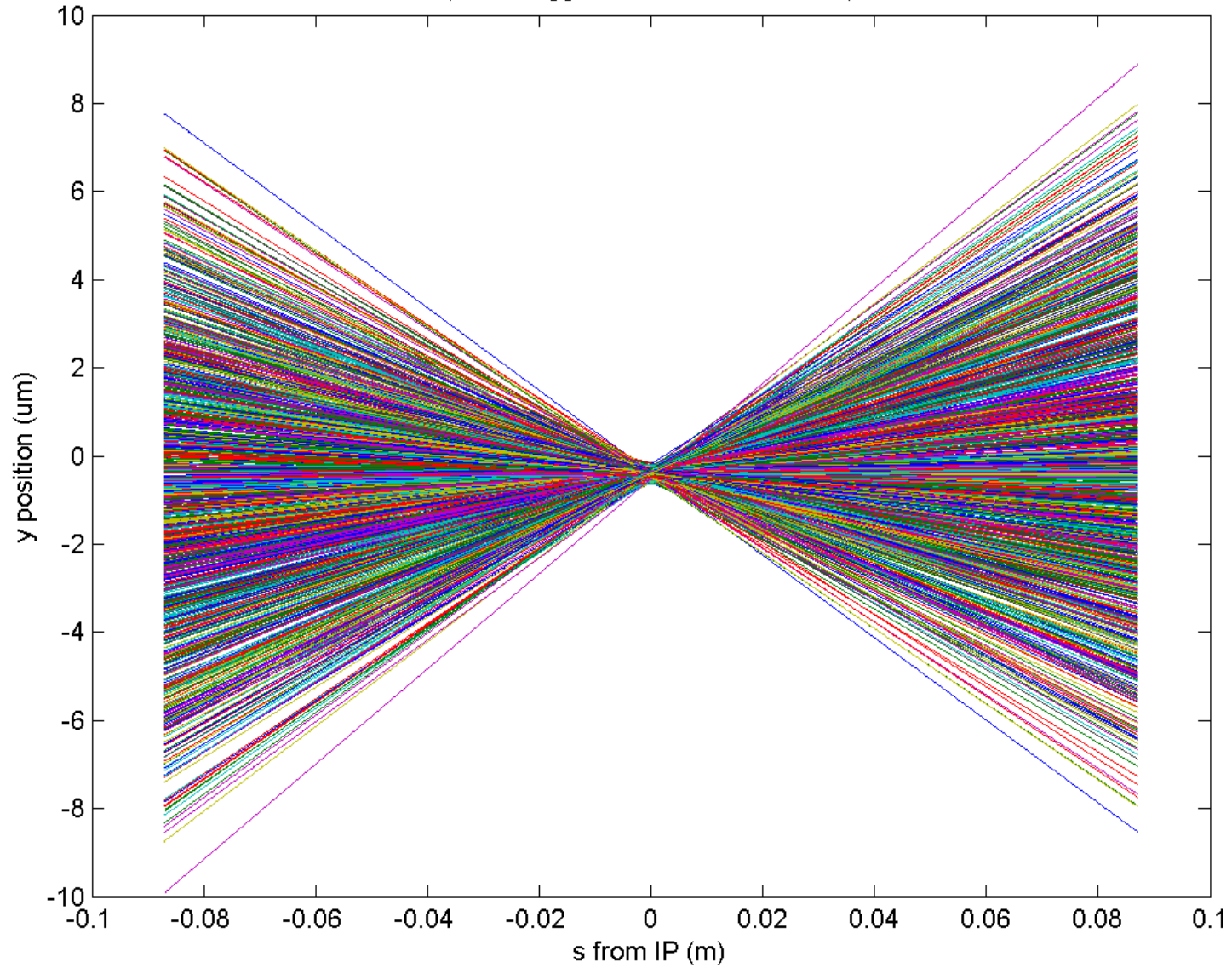




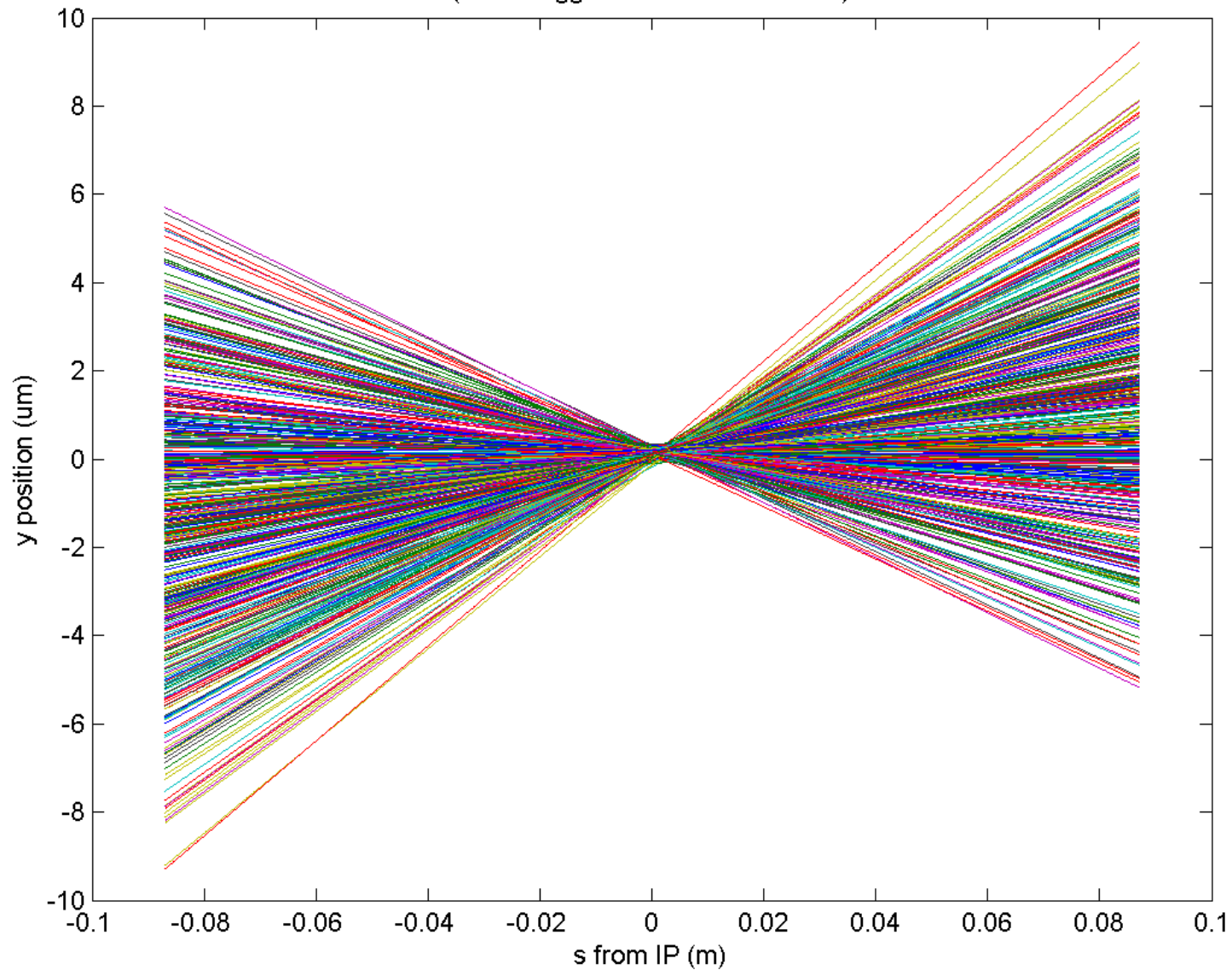




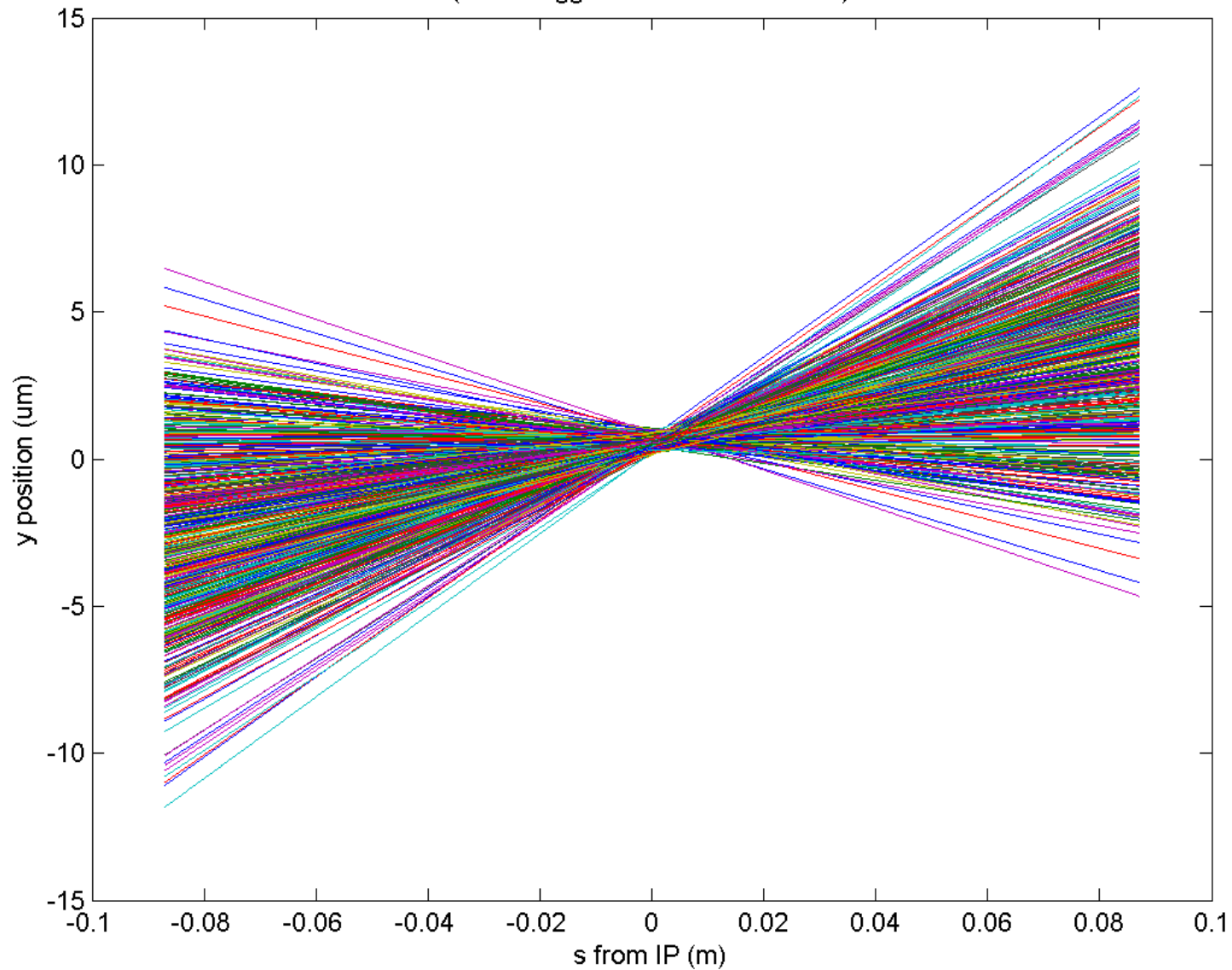
Interpolated y beam paths from IPB to IPC for jitRun4_0dB on 311014
(with 6 triggers removed from 1000)



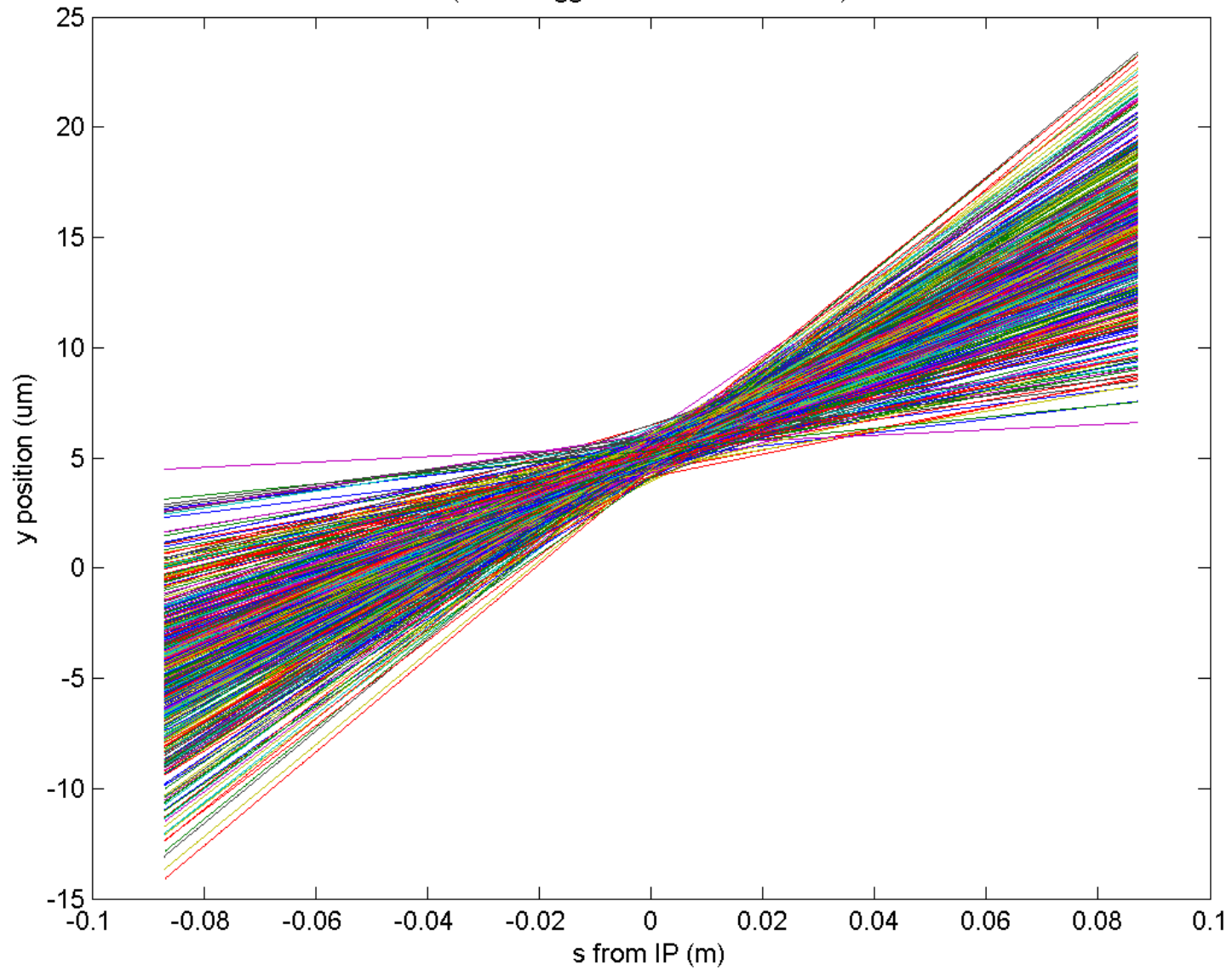
Interpolated y beam paths from IPB to IPC for jitRun5_10dB on 311014
(with 7 triggers removed from 500)



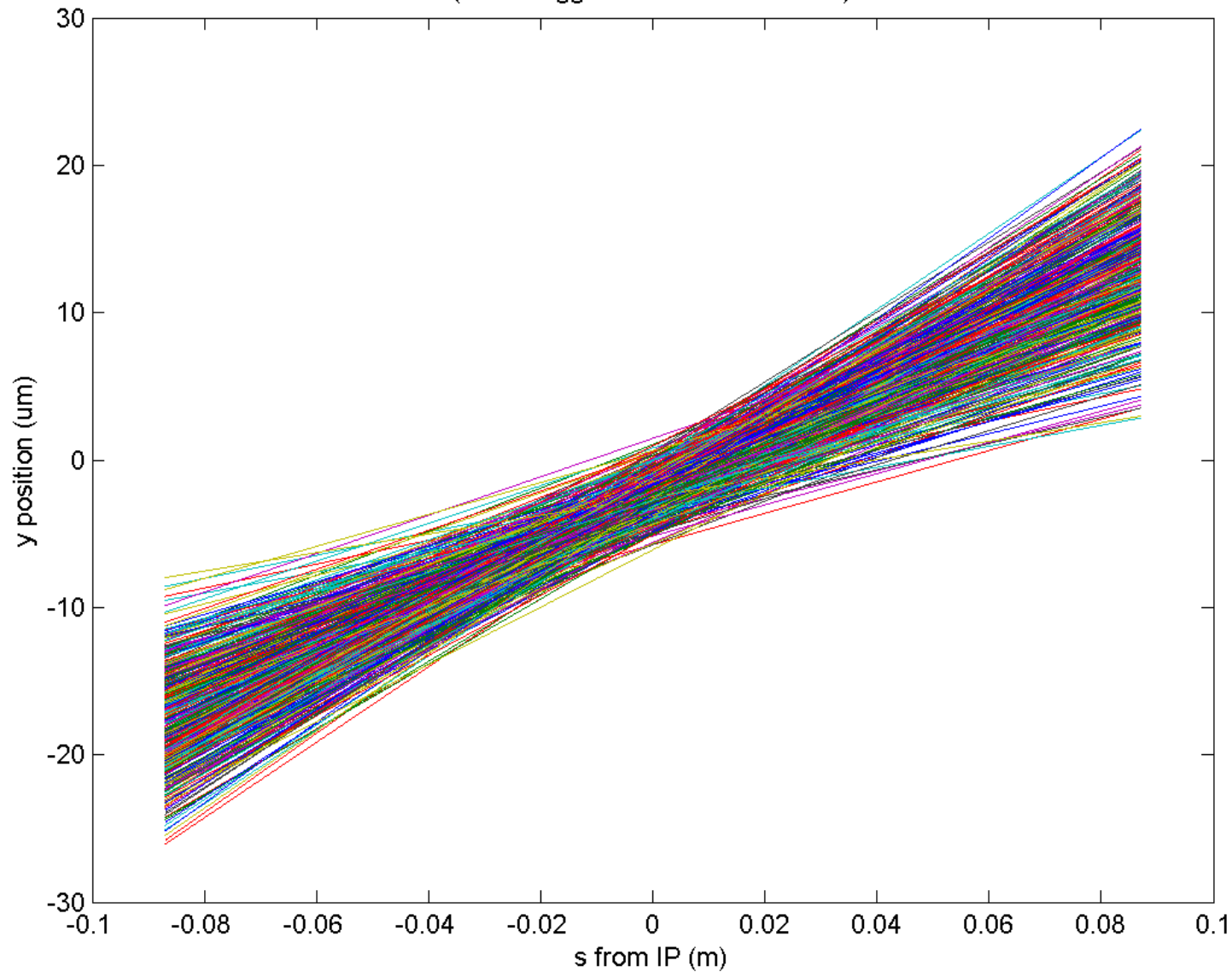
Interpolated y beam paths from IPB to IPC for jitRun6_20dB on 311014
(with 4 triggers removed from 500)



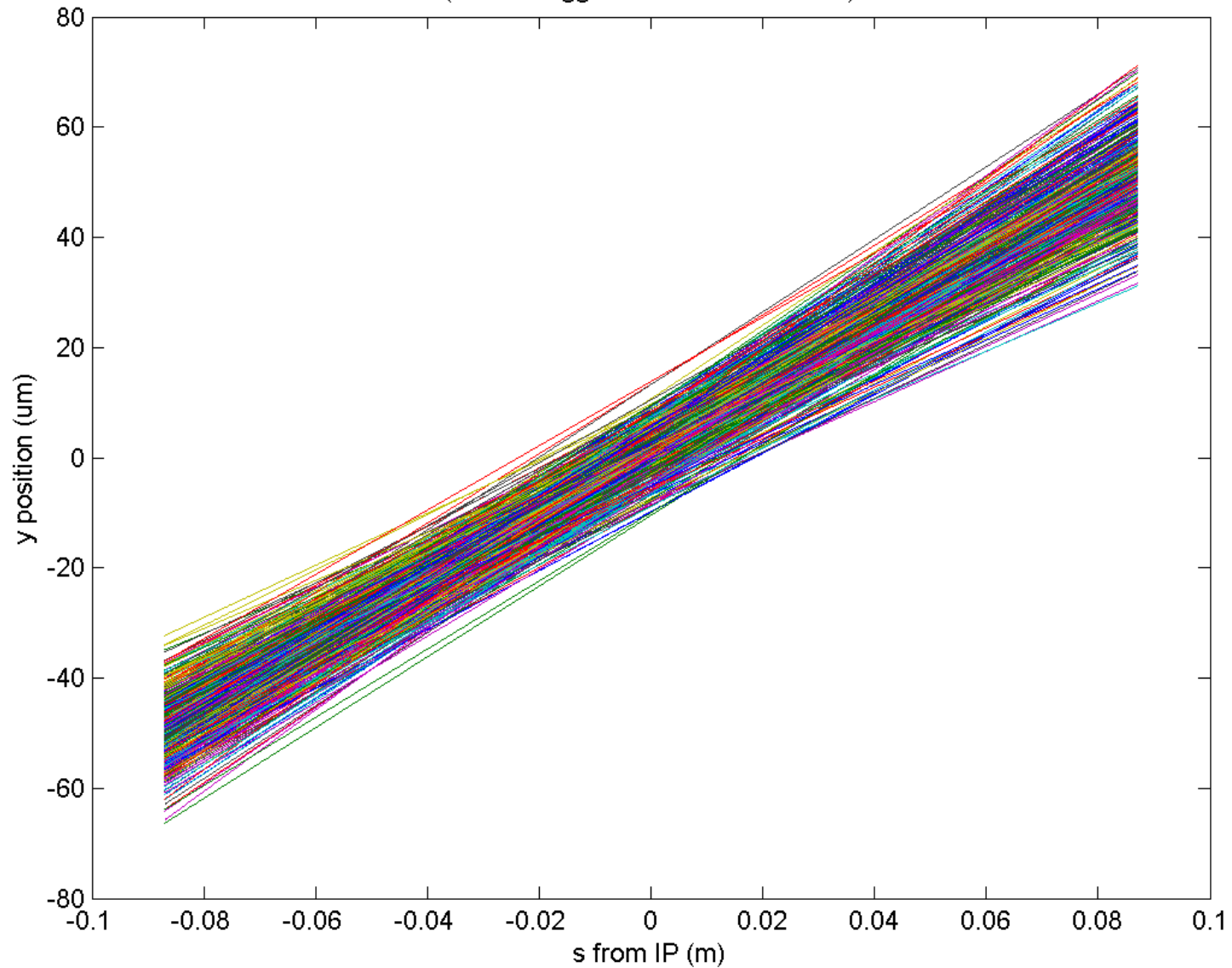
Interpolated y beam paths from IPB to IPC for jitRun7_30dB on 311014
(with 3 triggers removed from 500)



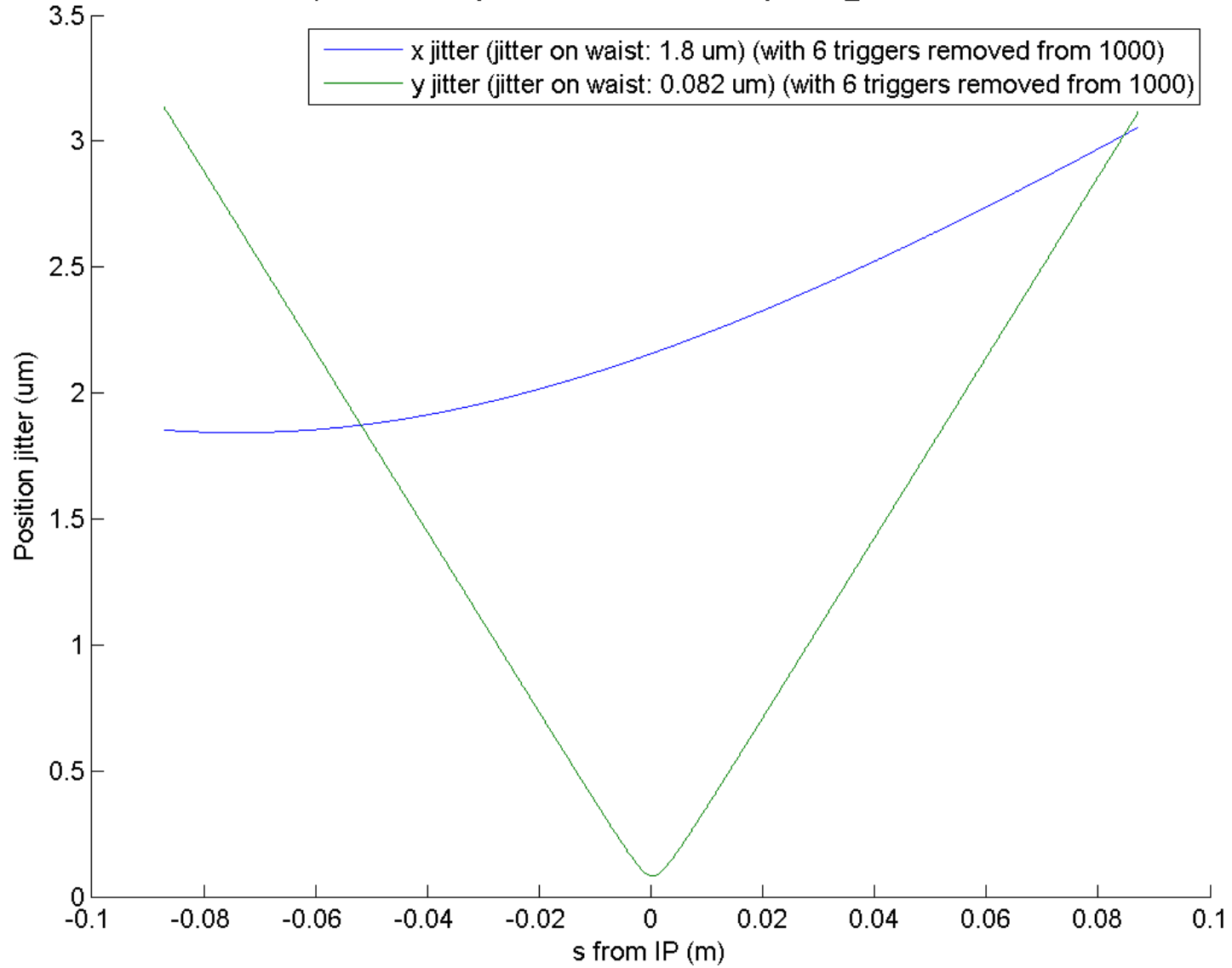
Interpolated y beam paths from IPB to IPC for jitRun8_40dB on 311014
(with 4 triggers removed from 500)



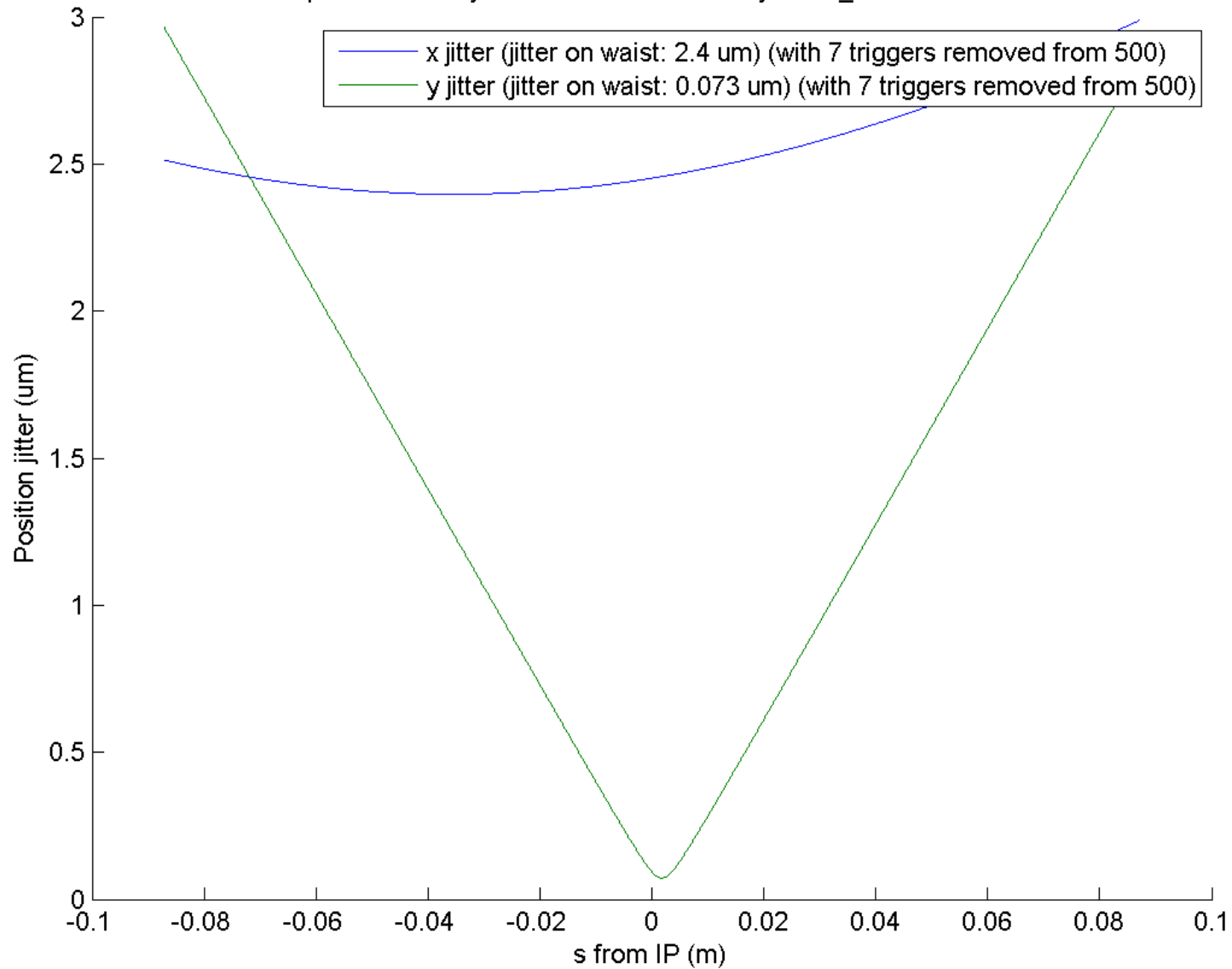
Interpolated y beam paths from IPB to IPC for jitRun9_50dB on 311014
(with 11 triggers removed from 500)



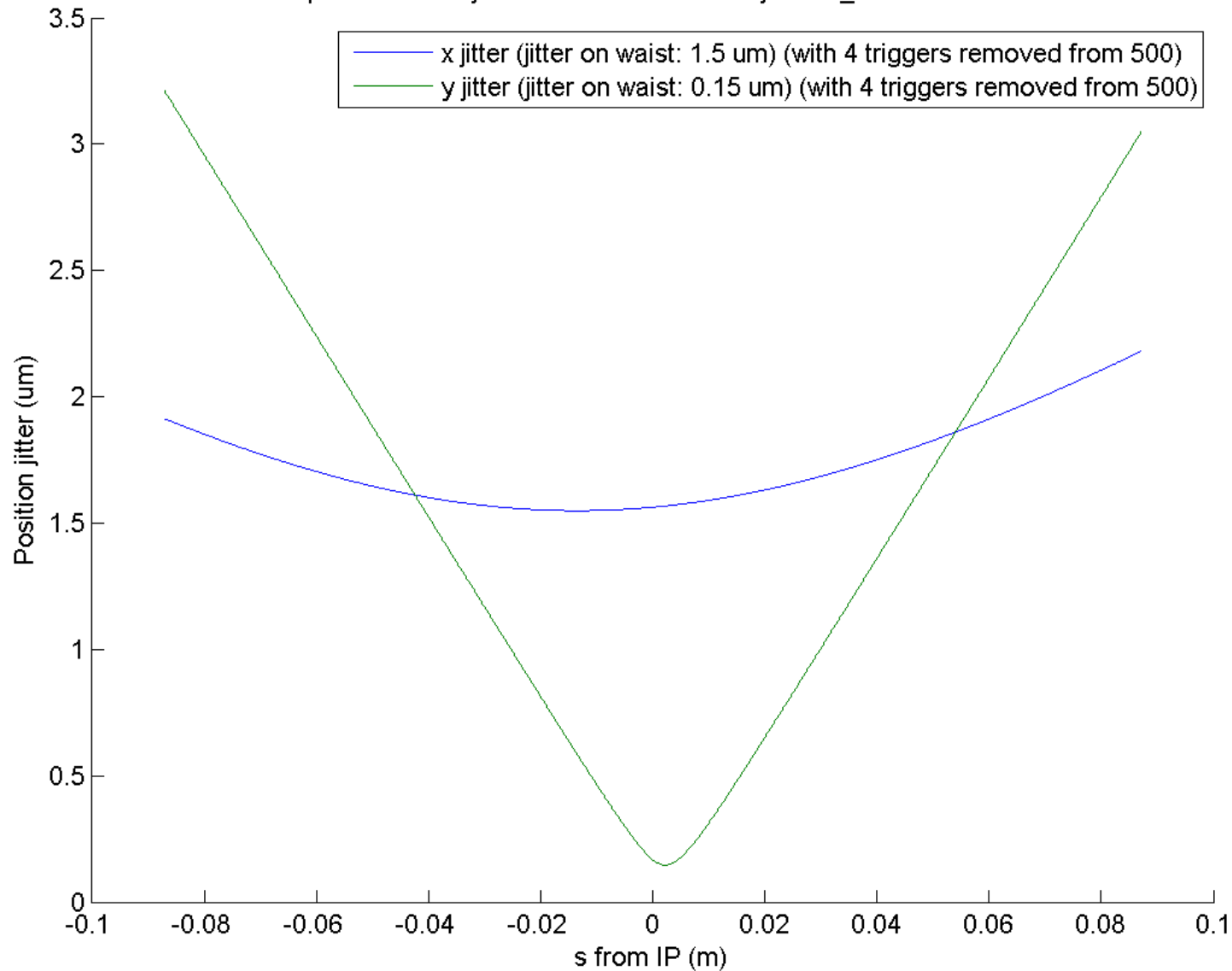
Interpolated beam jitter from IPB to IPC for jitRun4_0dB on 311014



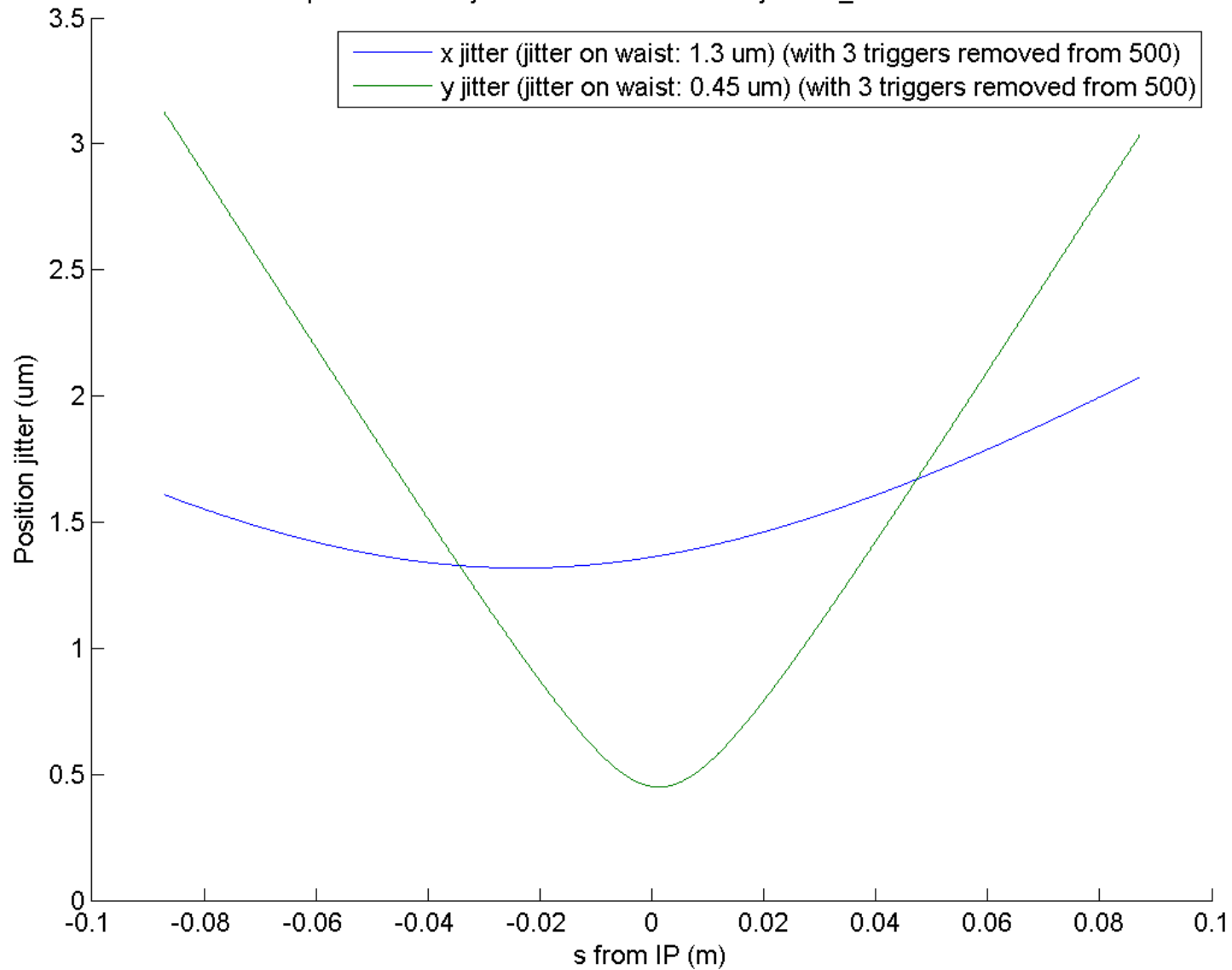
Interpolated beam jitter from IPB to IPC for jitRun5_10dB on 311014



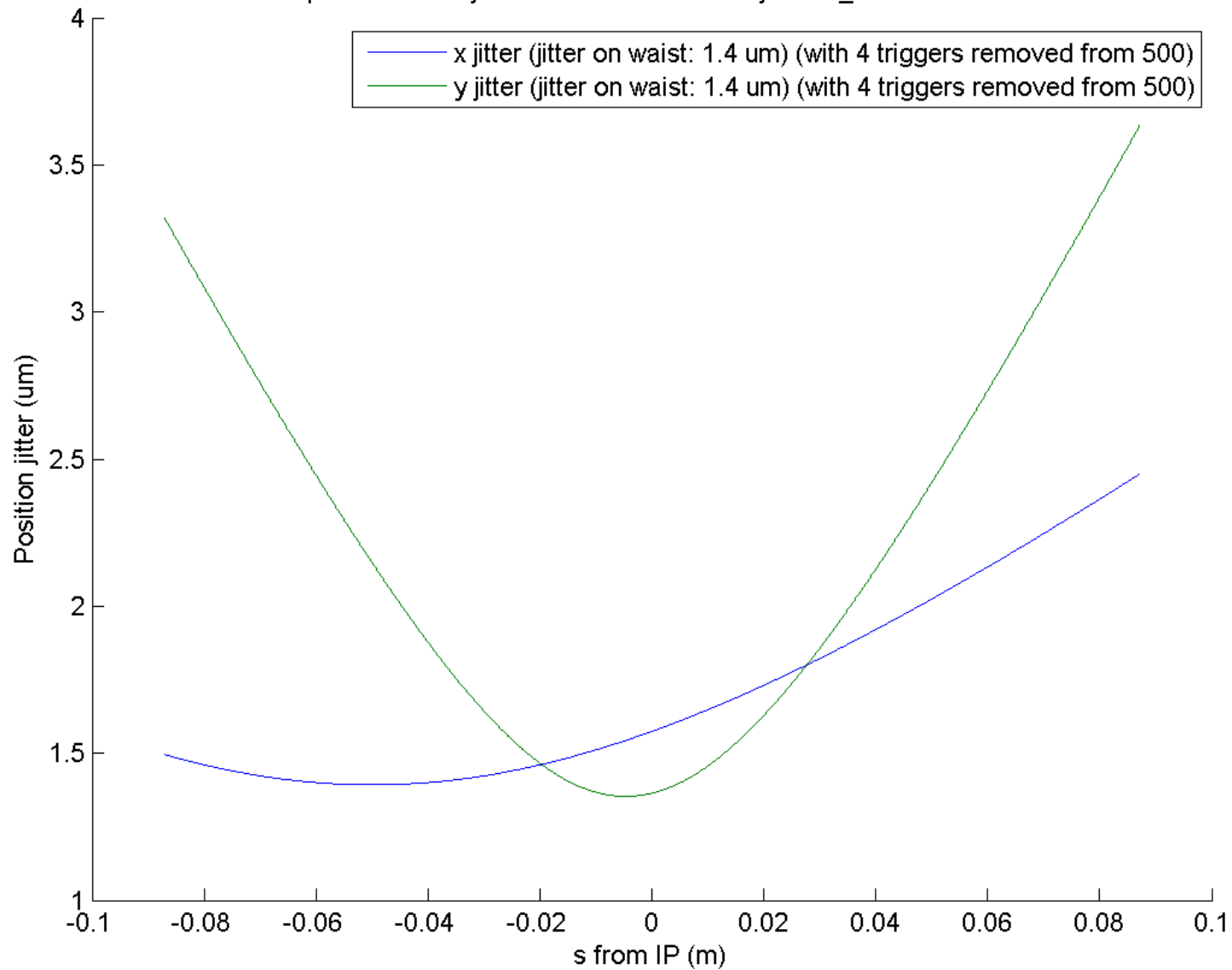
Interpolated beam jitter from IPB to IPC for jitRun6_20dB on 311014



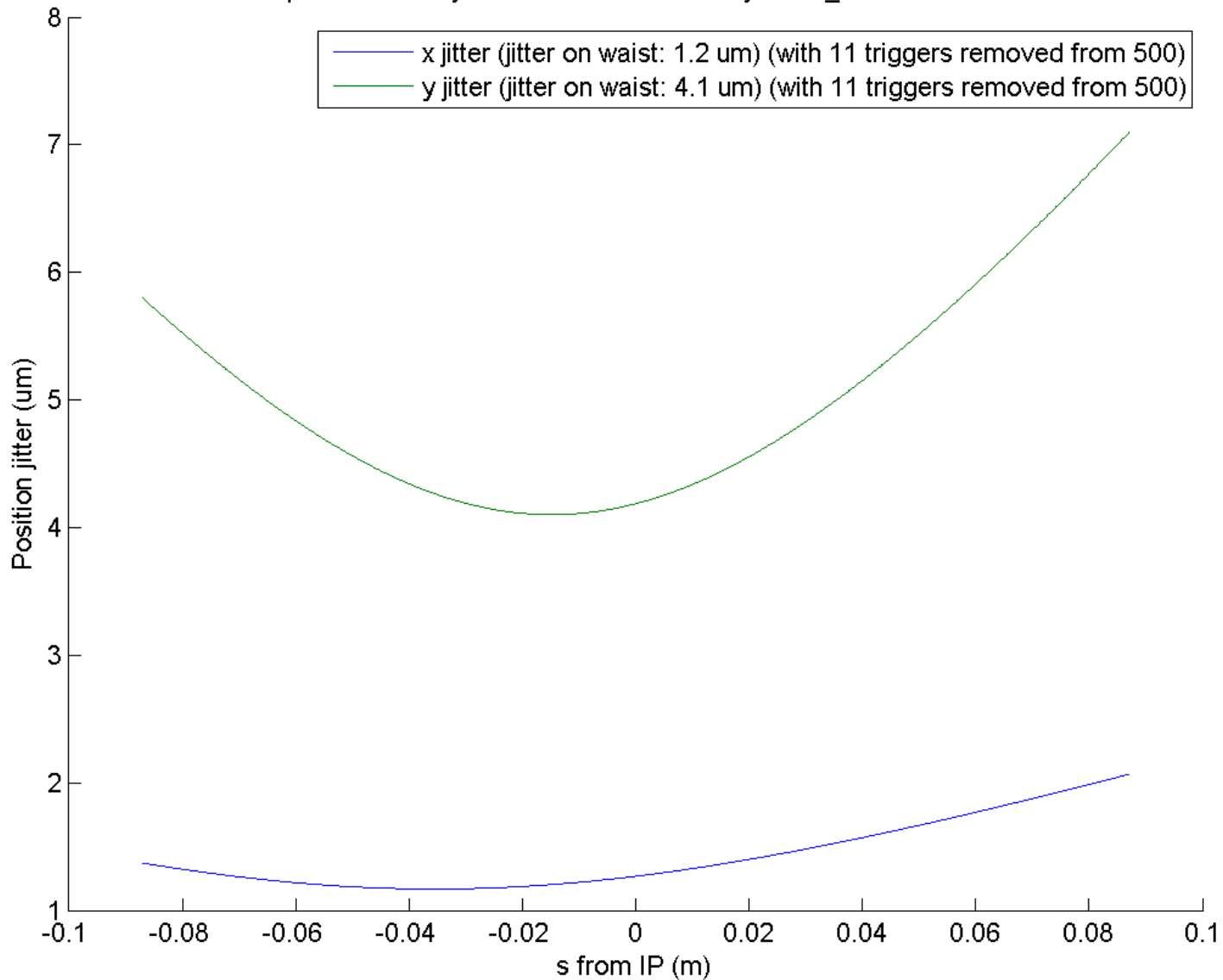
Interpolated beam jitter from IPB to IPC for jitRun7_30dB on 311014



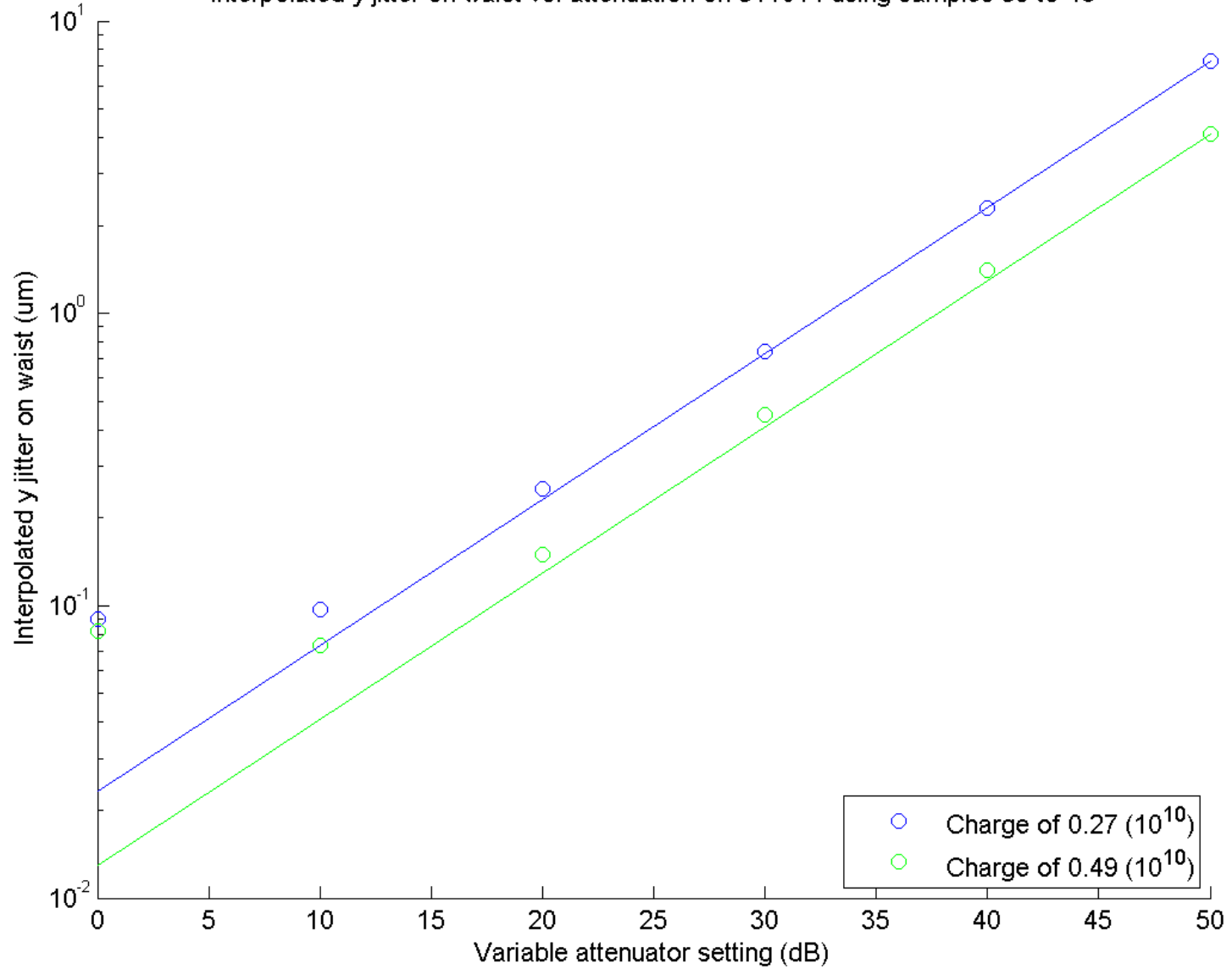
Interpolated beam jitter from IPB to IPC for jitRun8_40dB on 311014



Interpolated beam jitter from IPB to IPC for jitRun9_50dB on 311014



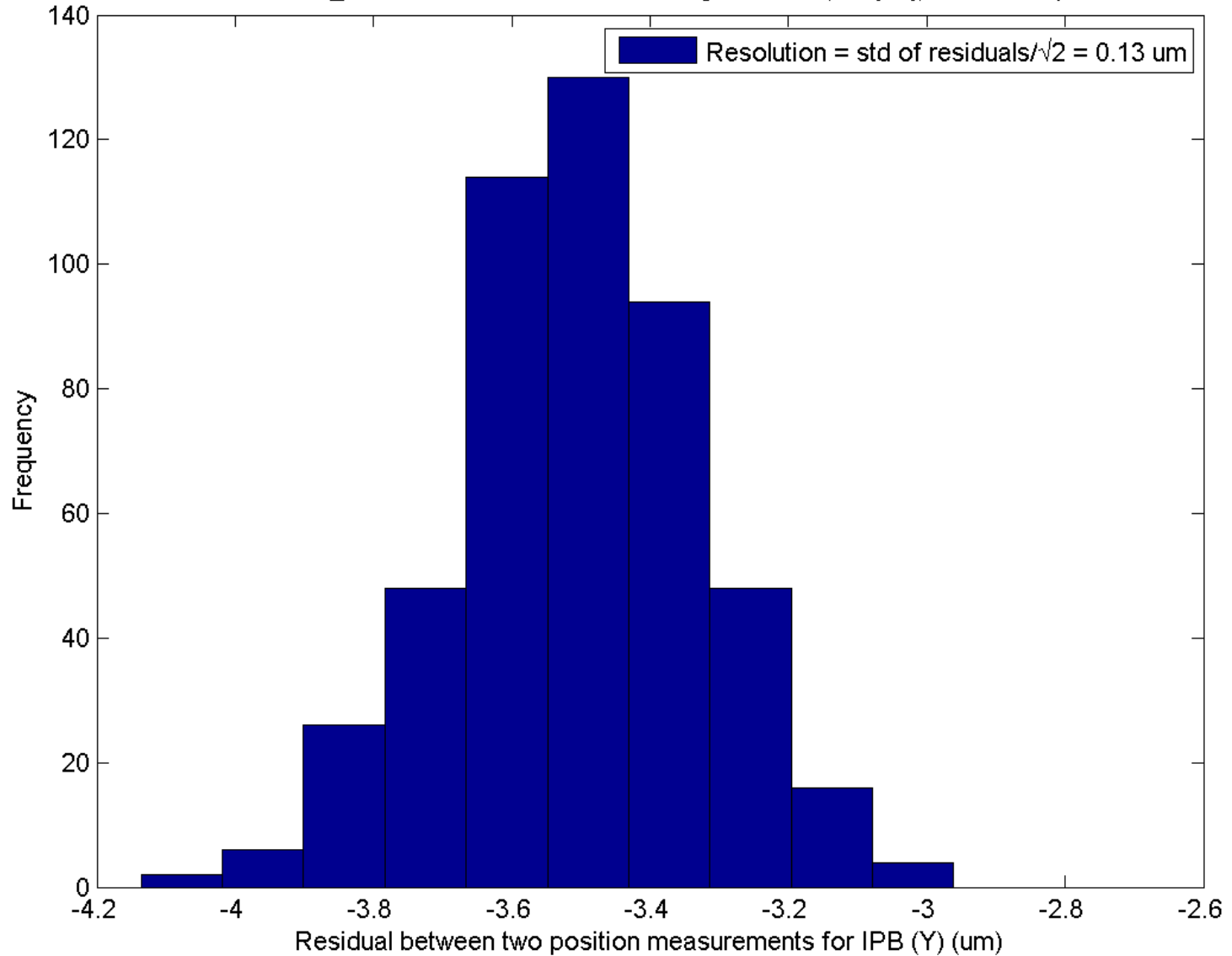
Interpolated y jitter on waist vs. attenuation on 311014 using samples 39 to 46



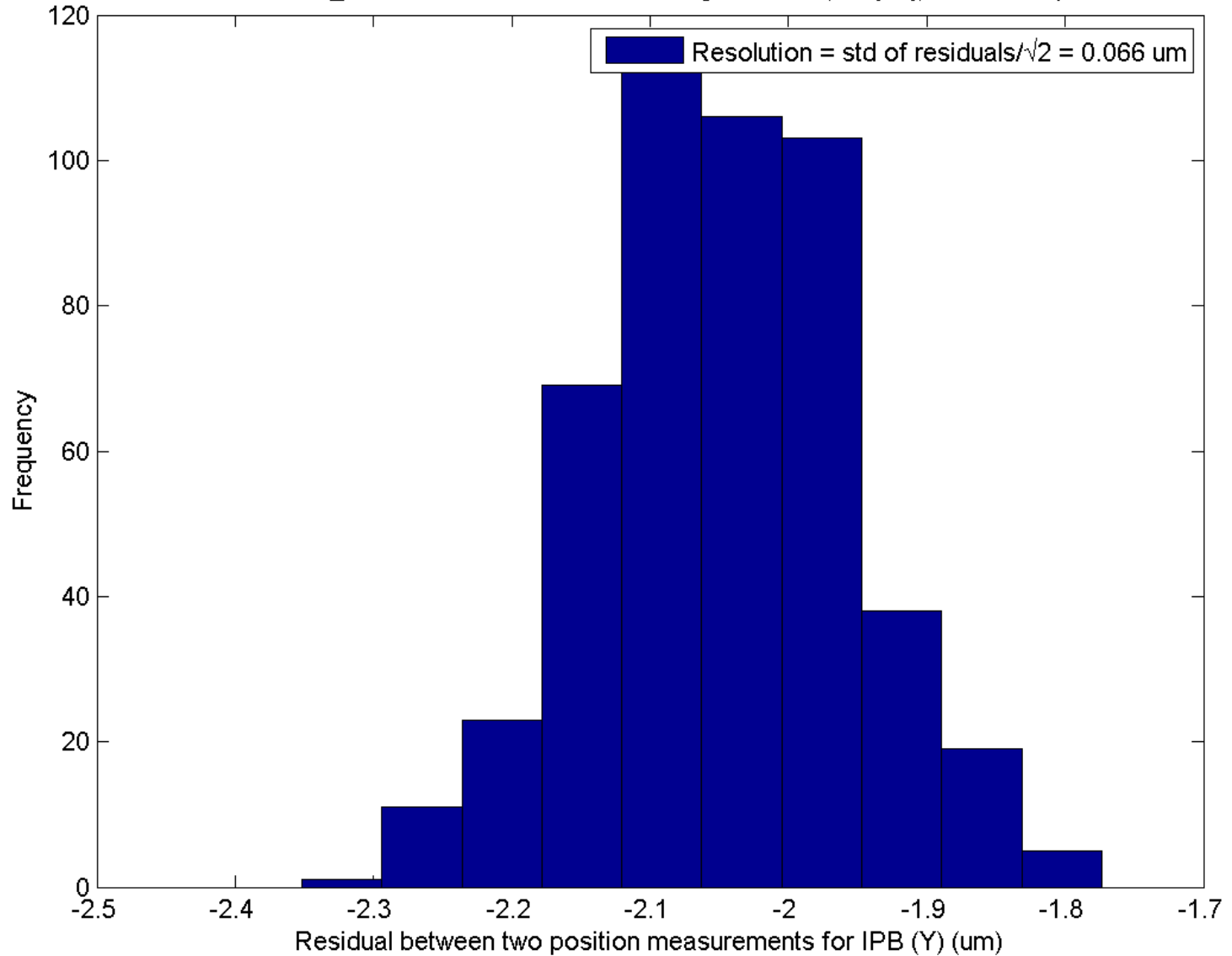
2-on-1 resolution

- Split IPB(Y) signal into two sets of Honda's electronics
- Use a calibration at each charge
- Use MFB1FF for charge normalisation (with 6 dB stripline attenuation)
- Histograms make use of 10-sample averaging from 37 to 46

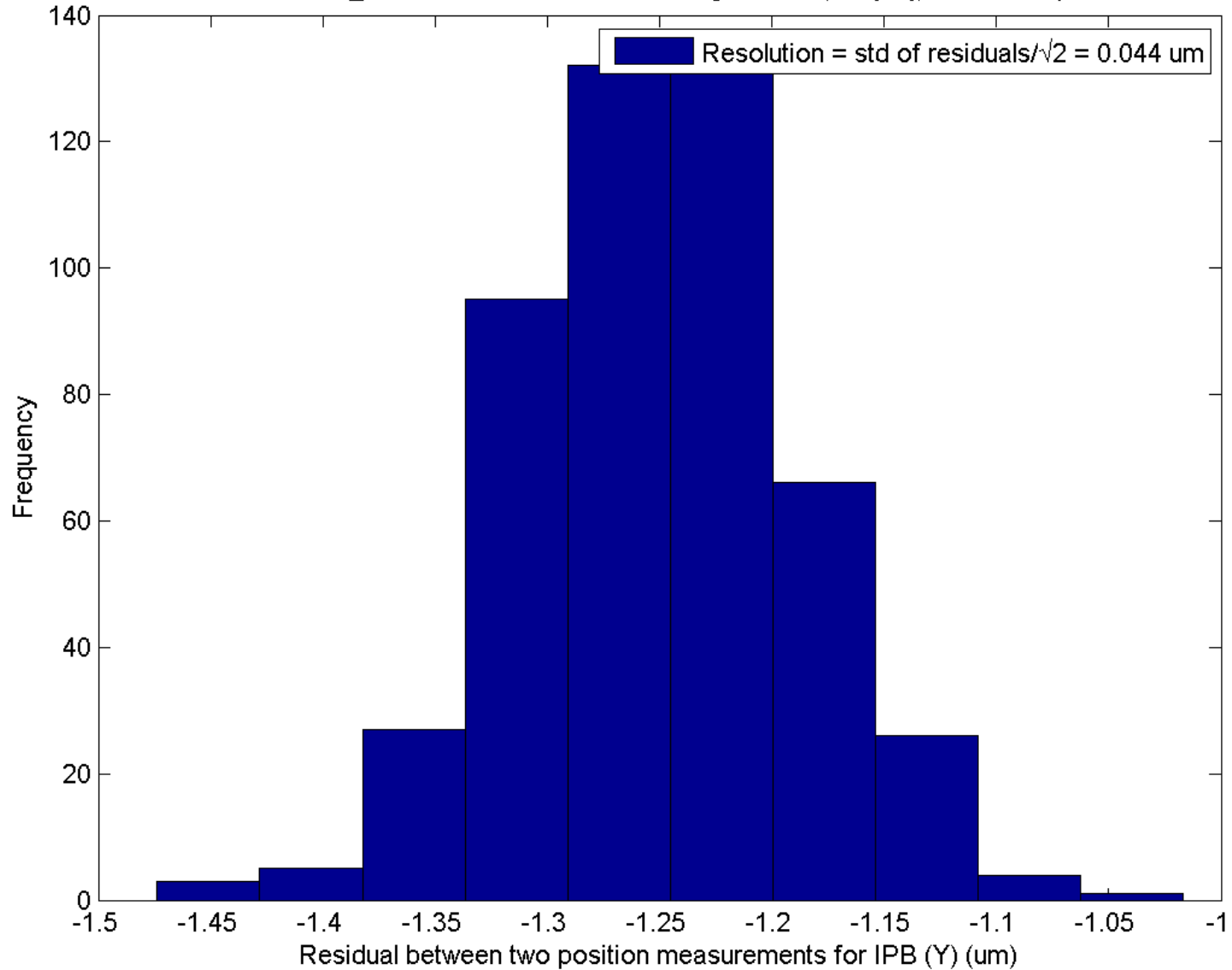
Histogram of residuals between two position measurements for bunch 1 at IPB (Y)
for ICTscan2_0.13 on 311014 with mean charge of $0.15 (10^{10})$ and 6 dB splitter



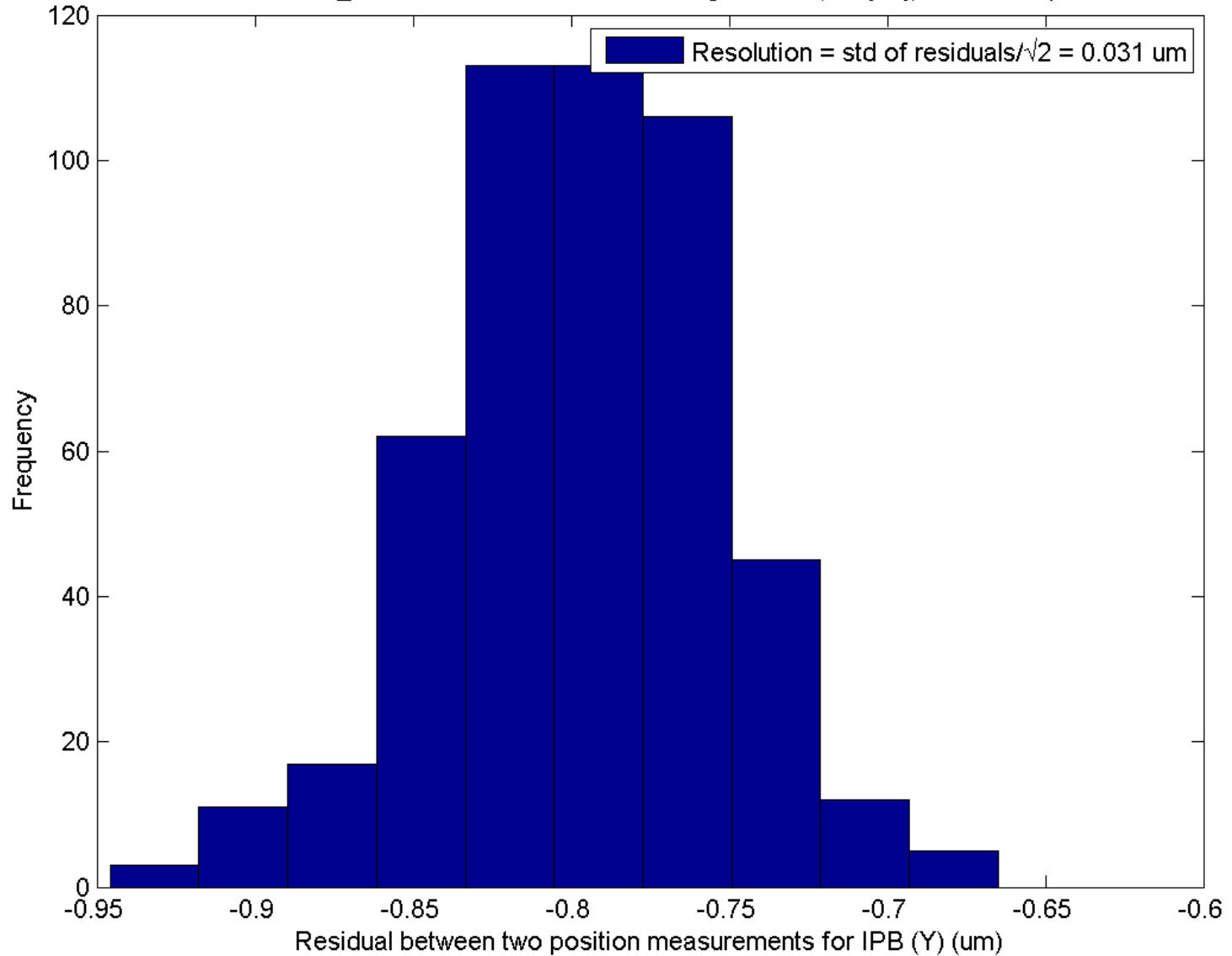
Histogram of residuals between two position measurements for bunch 1 at IPB (Y)
for ICTscan2_0.24 on 311014 with mean charge of $0.26 (10^{10})$ and 6 dB splitter



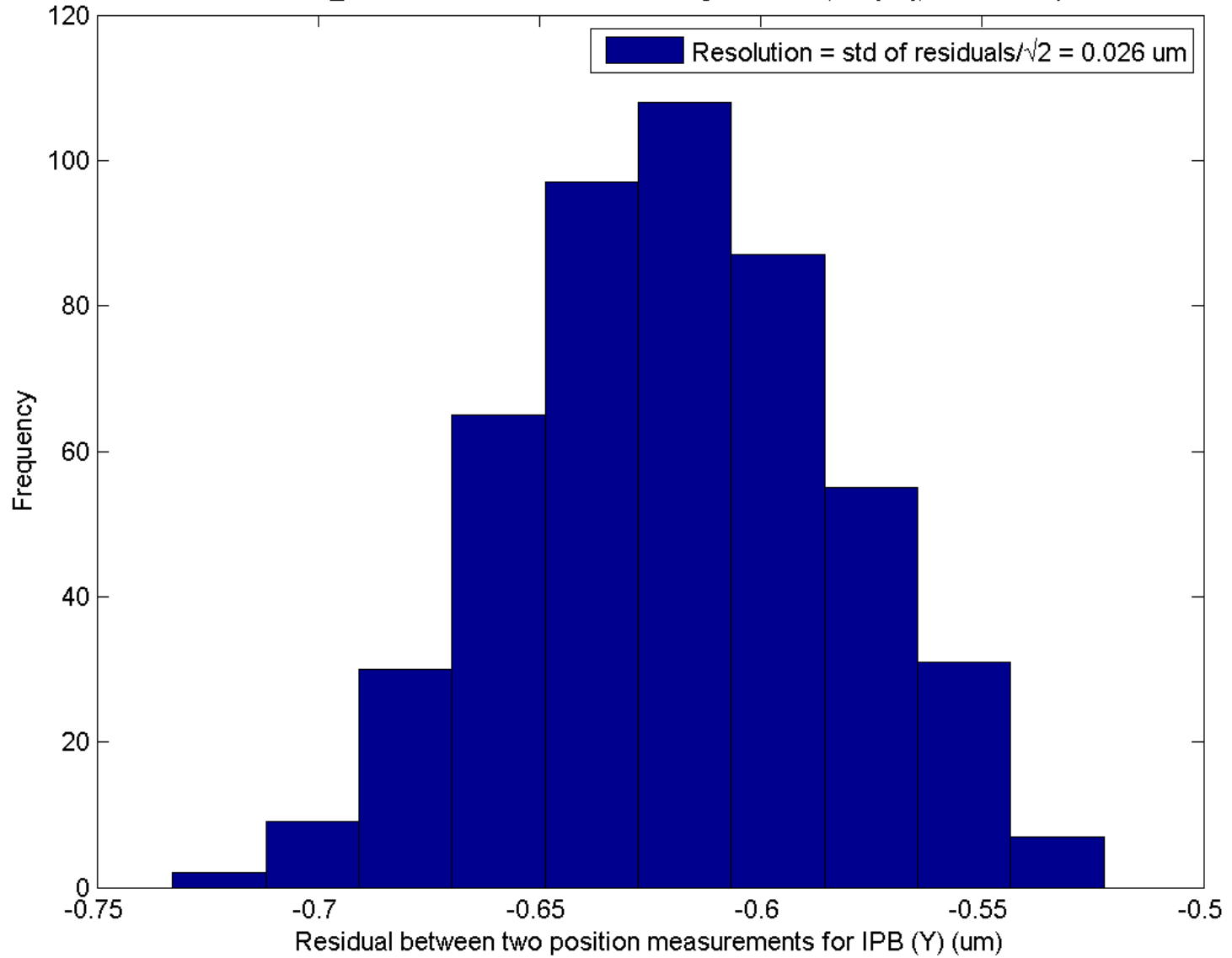
Histogram of residuals between two position measurements for bunch 1 at IPB (Y)
for ICTscan2_0.4 on 311014 with mean charge of $0.4 (10^{10})$ and 6 dB splitter

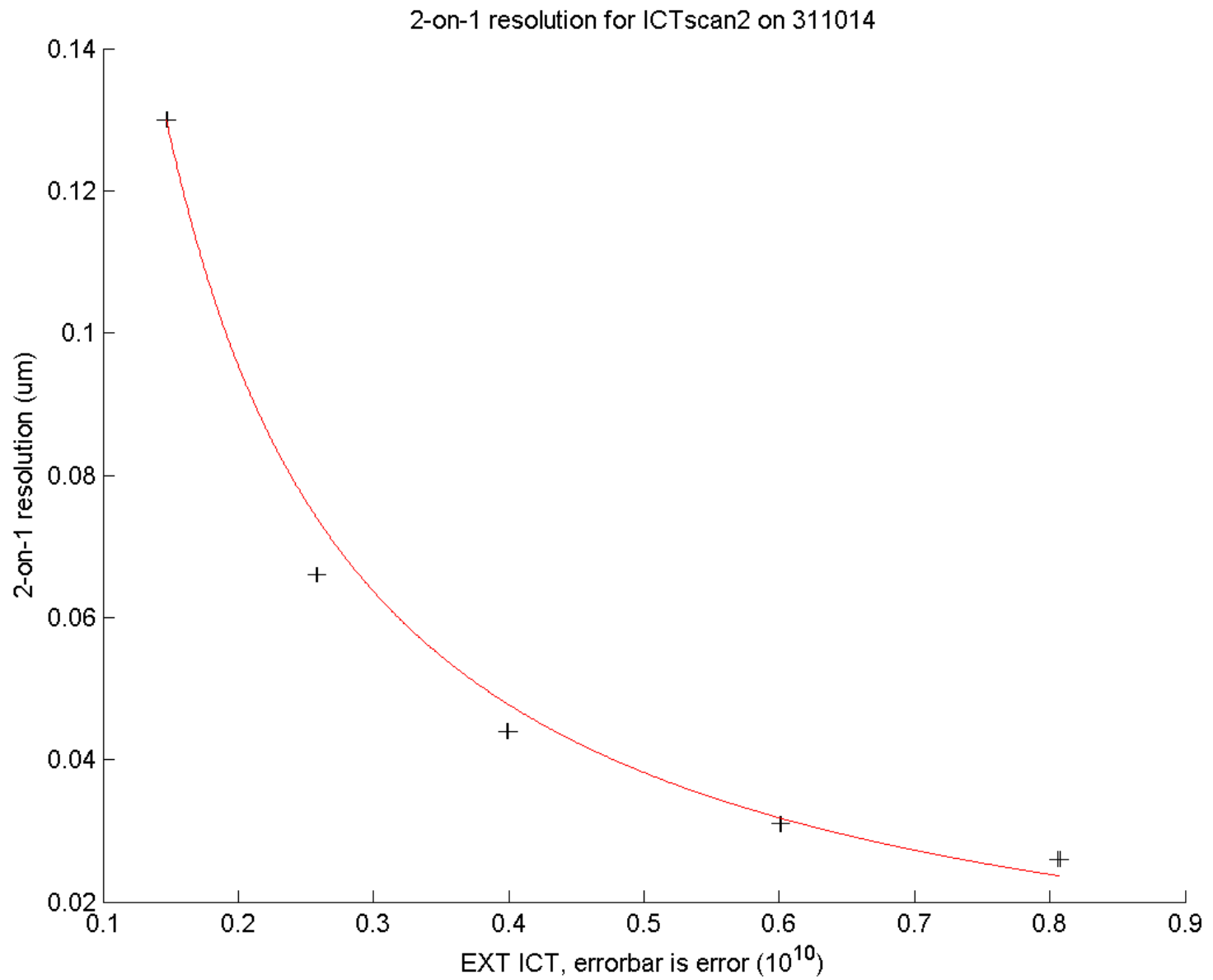


Histogram of residuals between two position measurements for bunch 1 at IPB (Y)
for ICTscan2_0.61 on 311014 with mean charge of $0.6 (10^{10})$ and 6 dB splitter



Histogram of residuals between two position measurements for bunch 1 at IPB (Y)
for ICTscan2_0.84 on 311014 with mean charge of $0.81 (10^{10})$ and 6 dB splitter

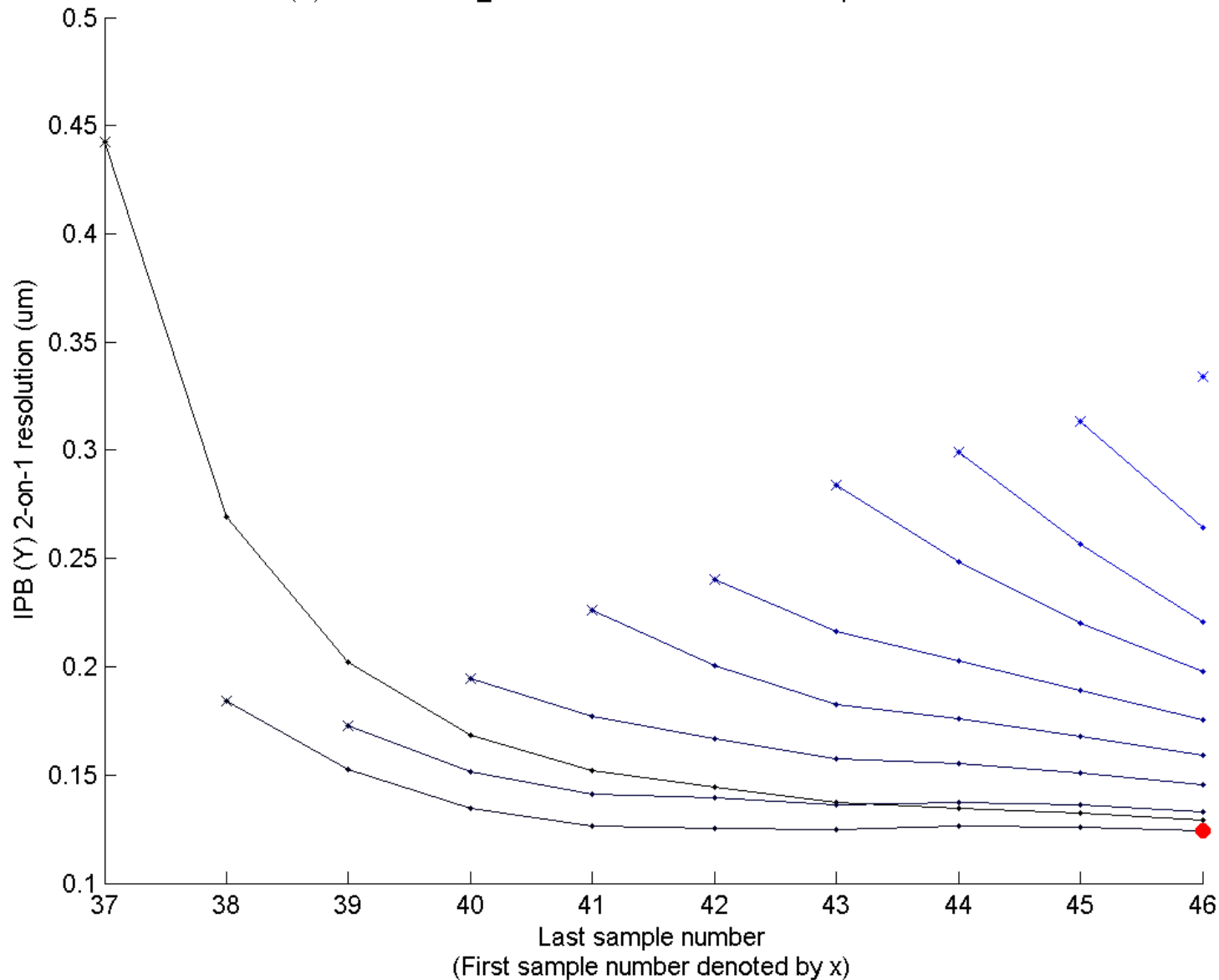




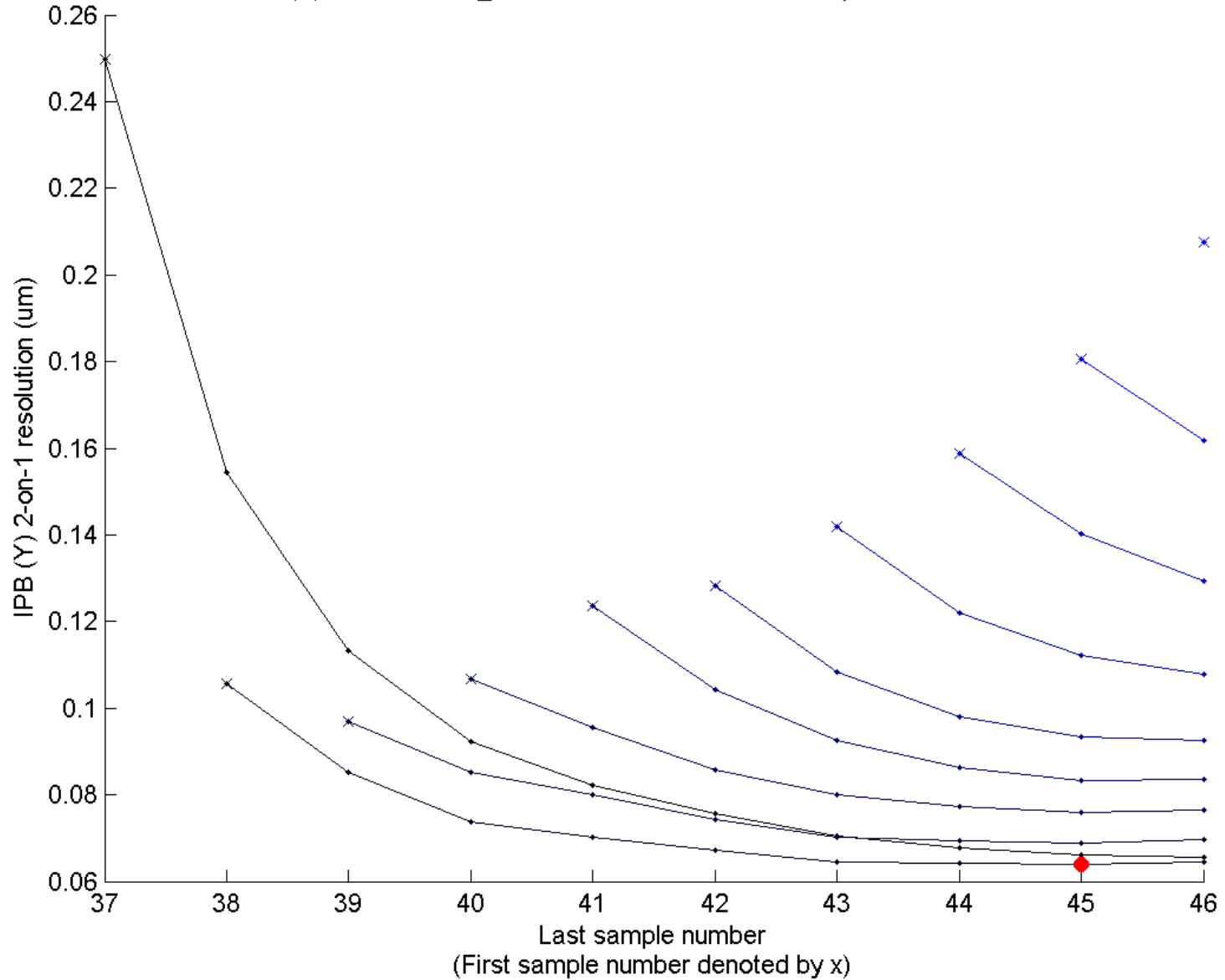
Appendix

2-on-1 resolution vs.
sampling window

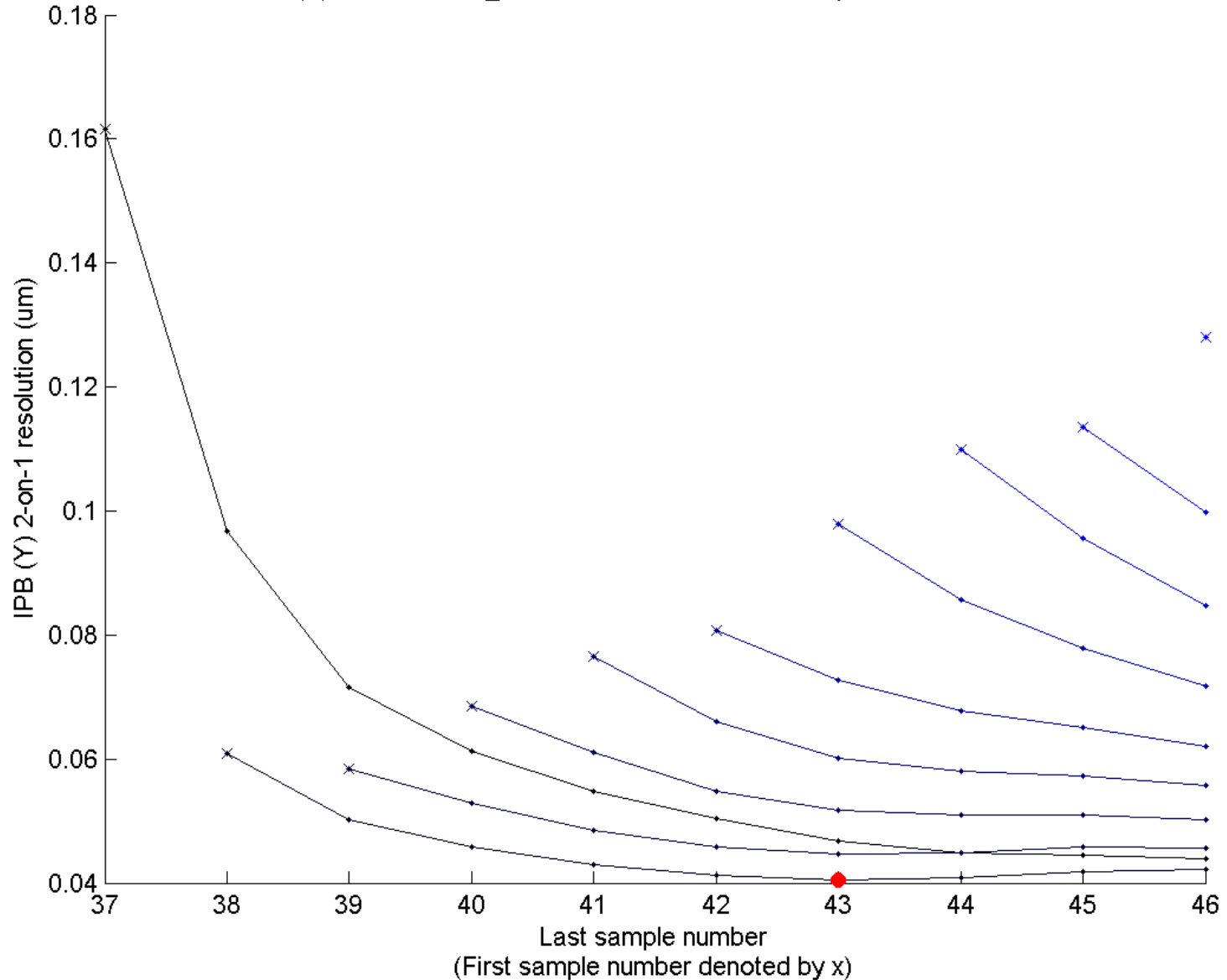
Averaging reduces minimum 2-on-1 resolution from 0.173 μm (sample 39) to 0.124 μm (samples 38 to 46)
at IPB (Y) for ICTscan2_0.13 bunch 1 on 311014 with 0 parameters subtracted



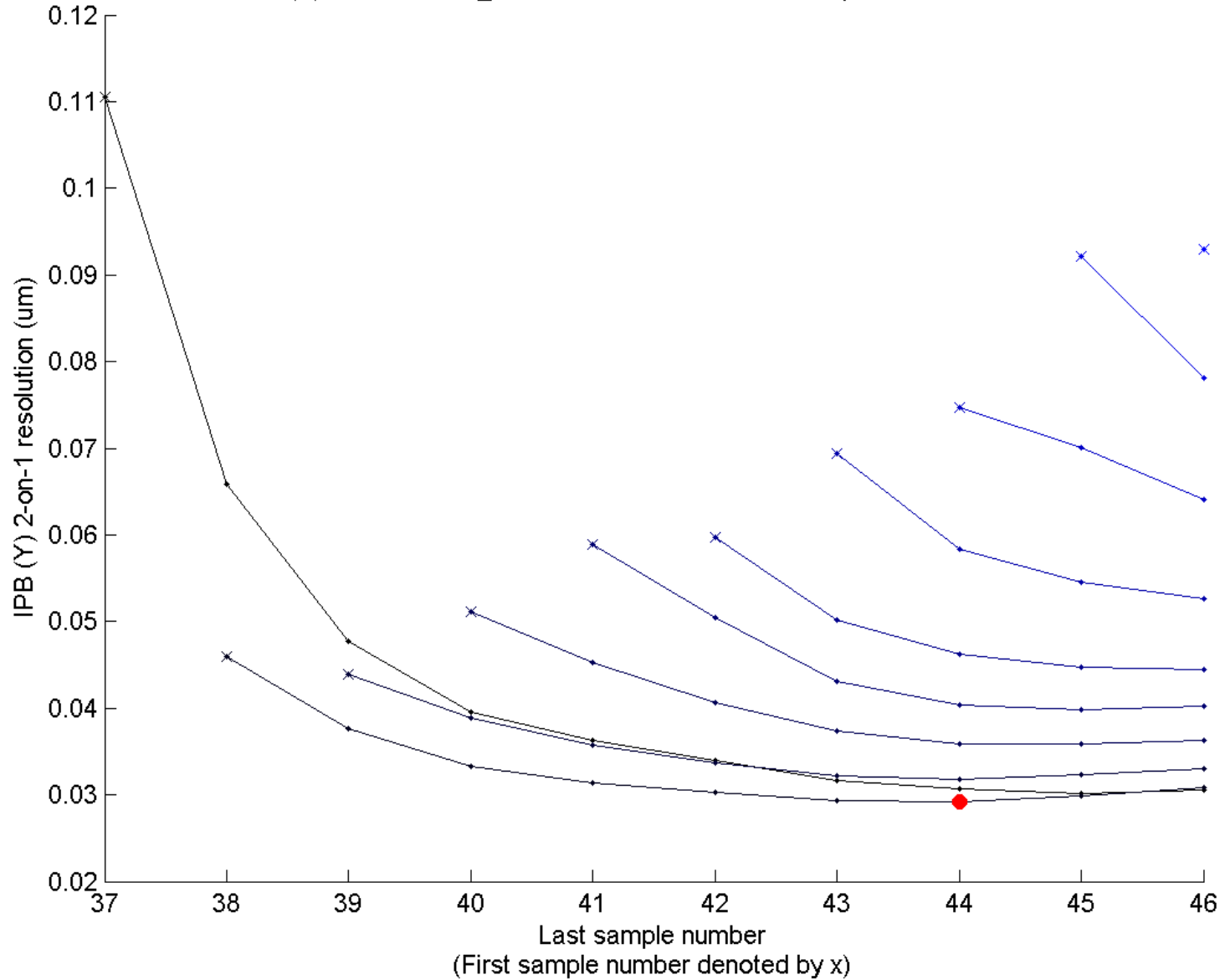
Averaging reduces minimum 2-on-1 resolution from 0.097 μm (sample 39) to 0.064 μm (samples 38 to 45)
at IPB (Y) for ICTscan2_0.24 bunch 1 on 311014 with 0 parameters subtracted



Averaging reduces minimum 2-on-1 resolution from 0.058 μm (sample 39) to 0.041 μm (samples 38 to 43)
at IPB (Y) for ICTscan2_0.4 bunch 1 on 311014 with 0 parameters subtracted



Averaging reduces minimum 2-on-1 resolution from 0.044 μm (sample 39) to 0.029 μm (samples 38 to 44)
at IPB (Y) for ICTscan2_0.61 bunch 1 on 311014 with 0 parameters subtracted



Averaging reduces minimum 2-on-1 resolution from 0.036 μm (sample 39) to 0.023 μm (samples 38 to 44)
at IPB (Y) for ICTscan2_0.84 bunch 1 on 311014 with 0 parameters subtracted

