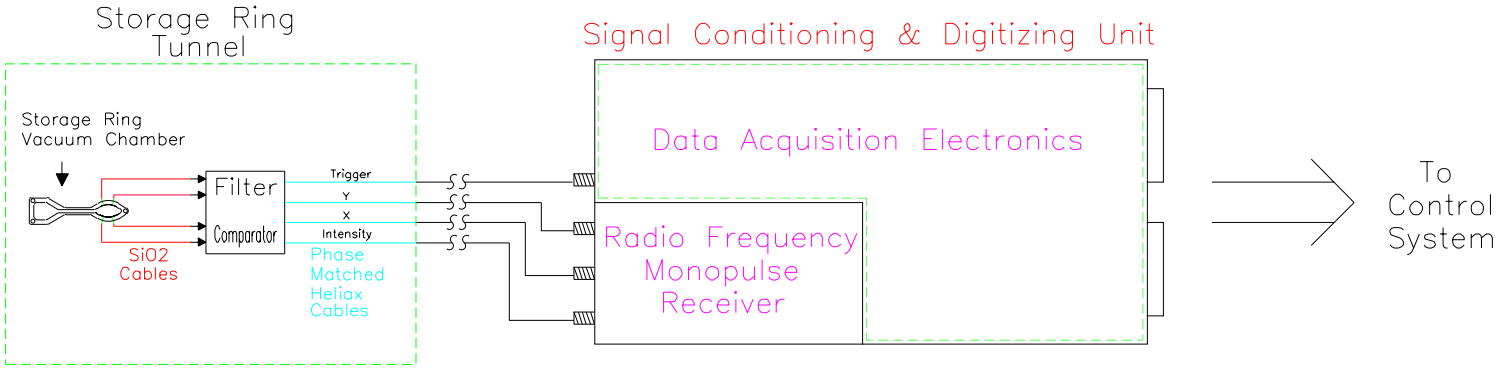
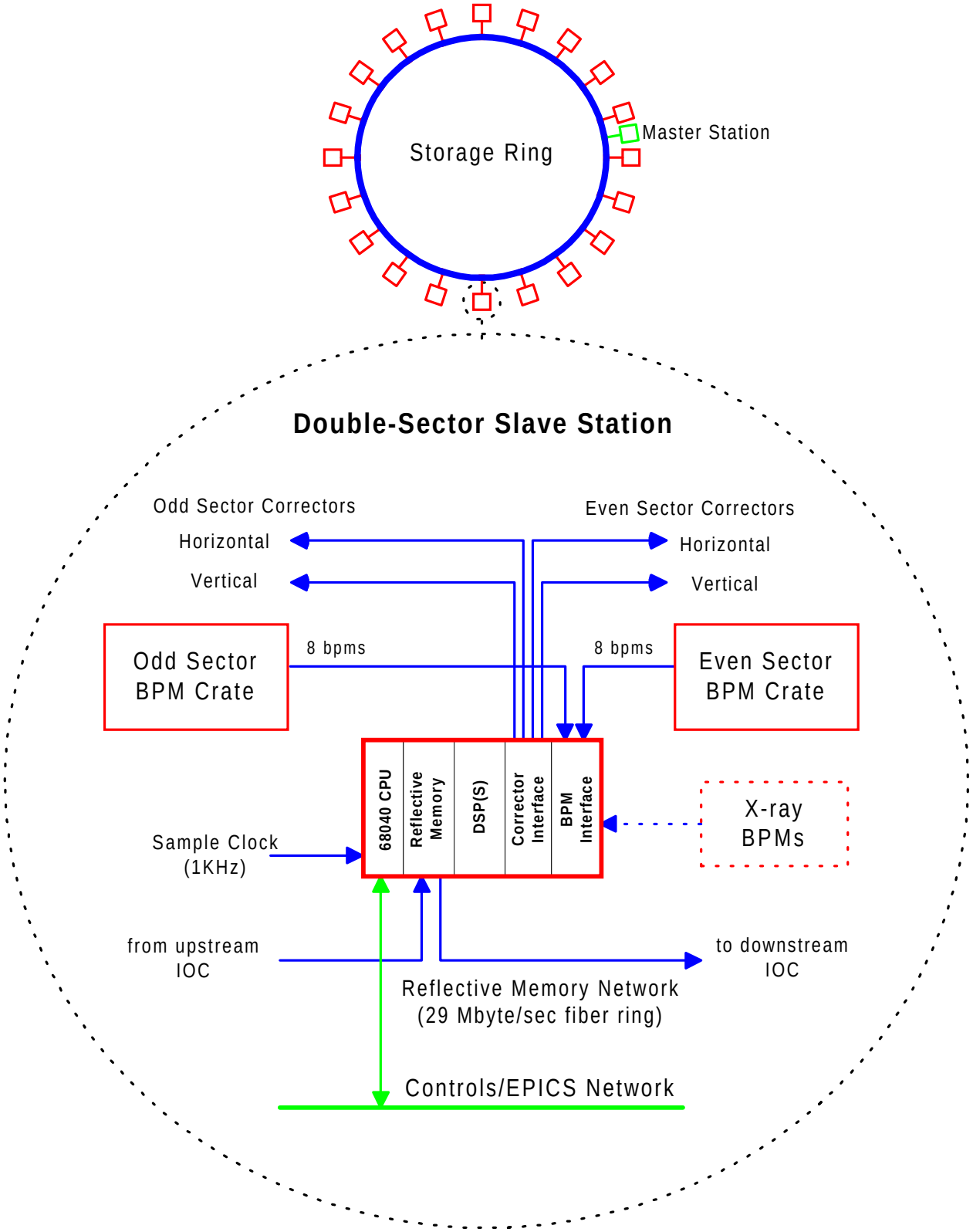
Block Diagram of Advanced Photon Source Beam Position Monitor System

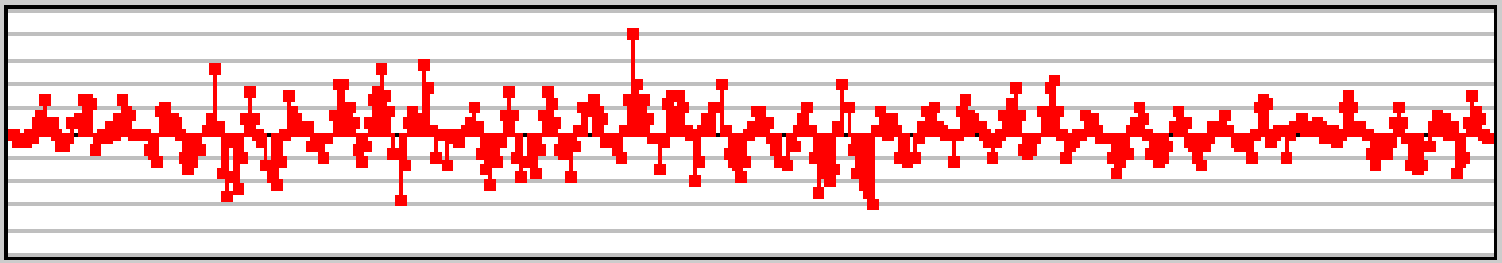


Real-Time Feedback Hardware Configuration



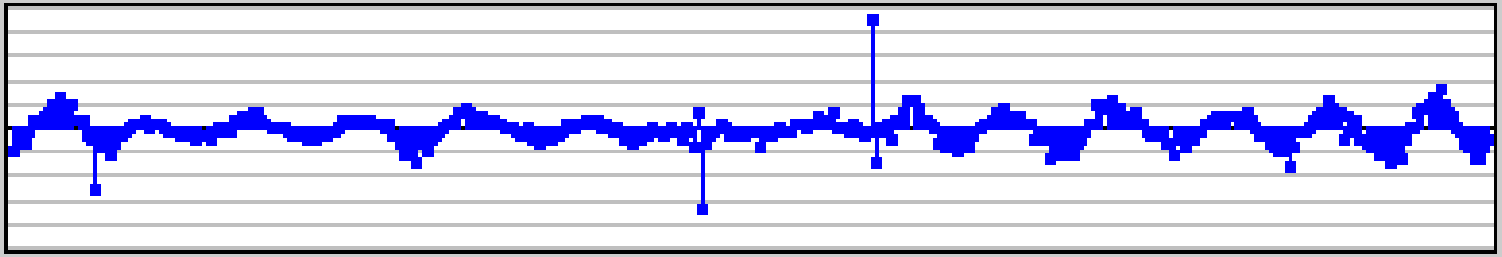
SR H WEIGHTED AVERAGE BPM'S (mm) AVG: -0.000 MAX: 0.019

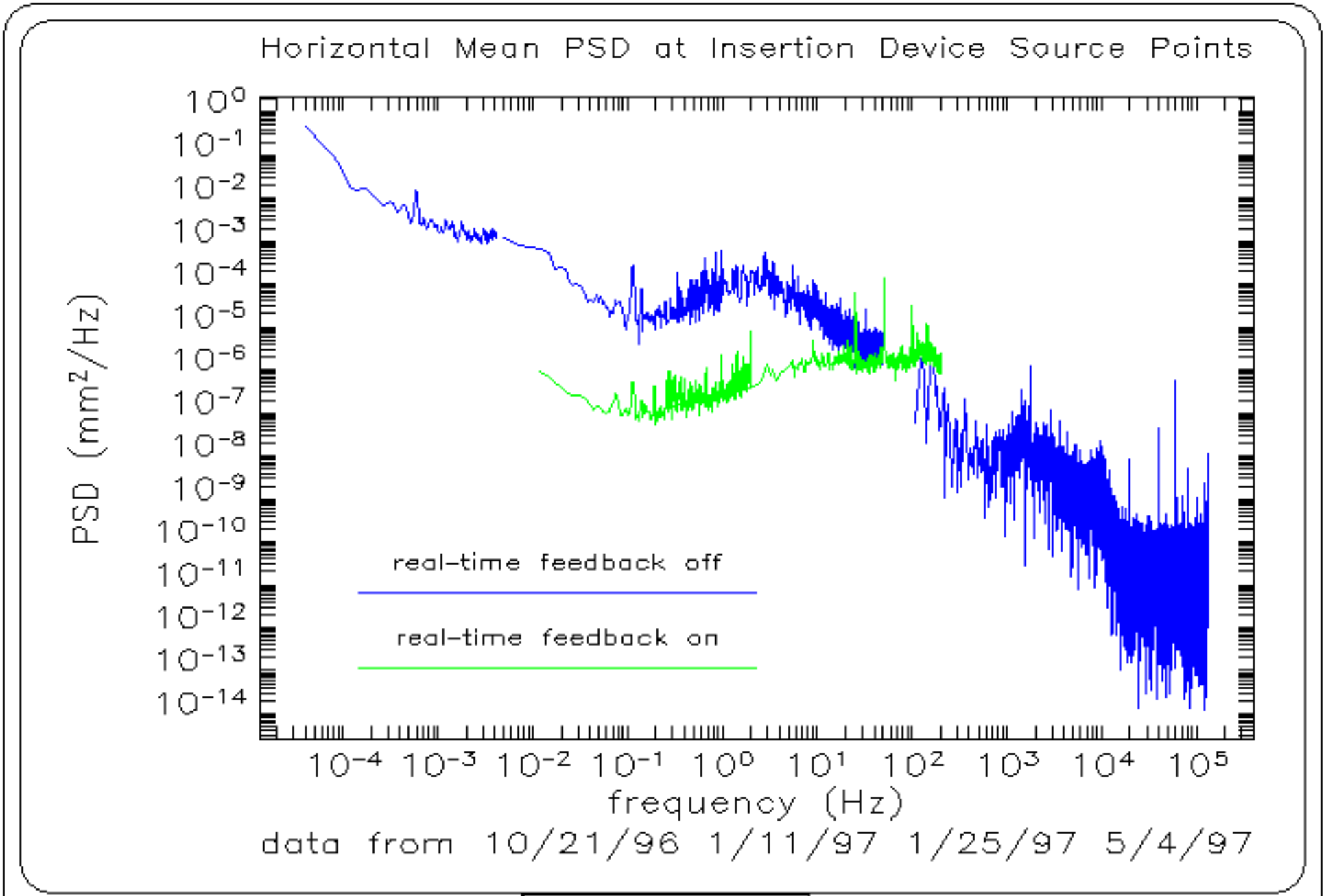
0.005 /Div Center: 0.000



SR V WEIGHTED AVERAGE BPM'S (mm) AVG: -0.000 MAX: 0.024

0.005 /Div Center: 0.000

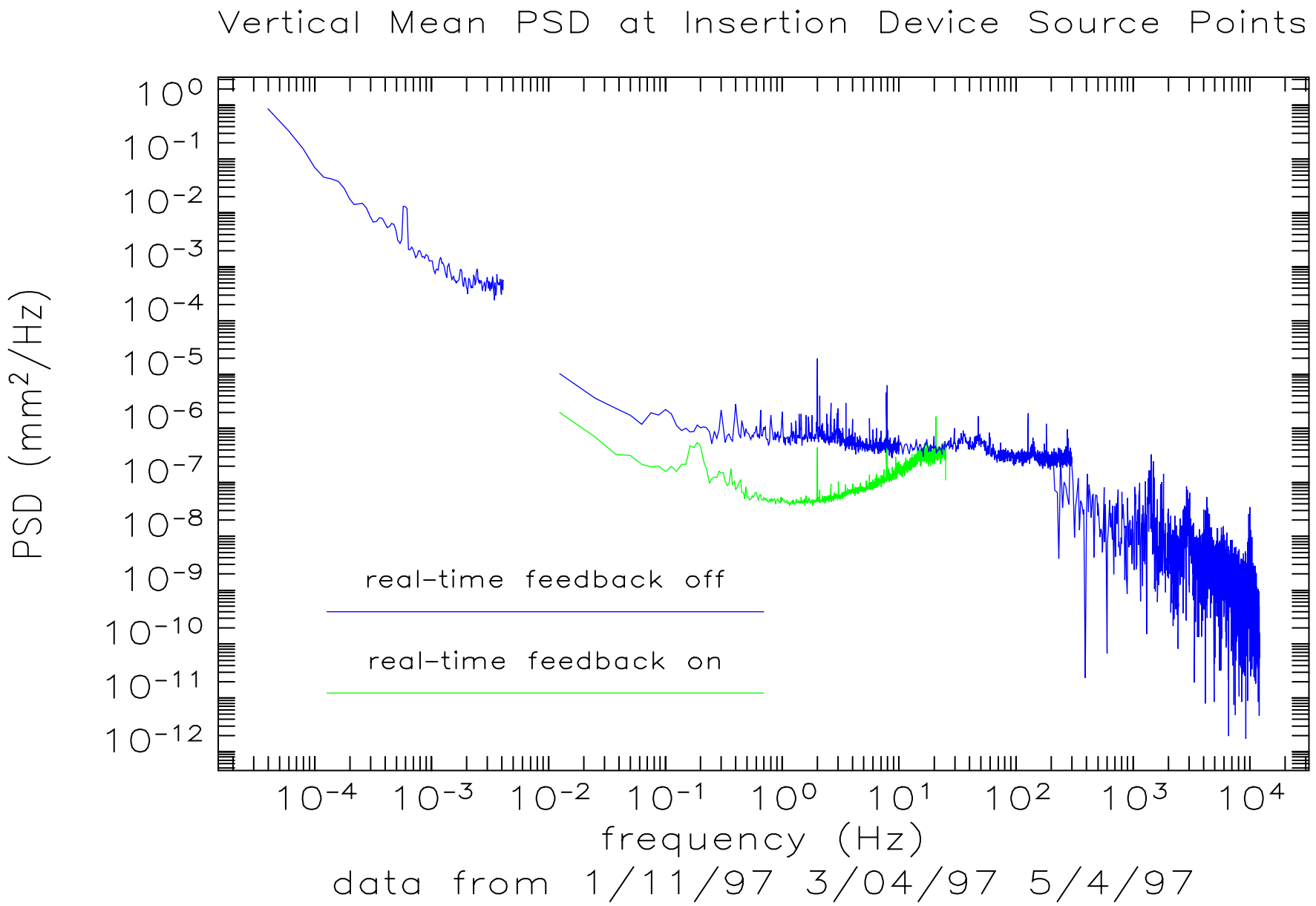


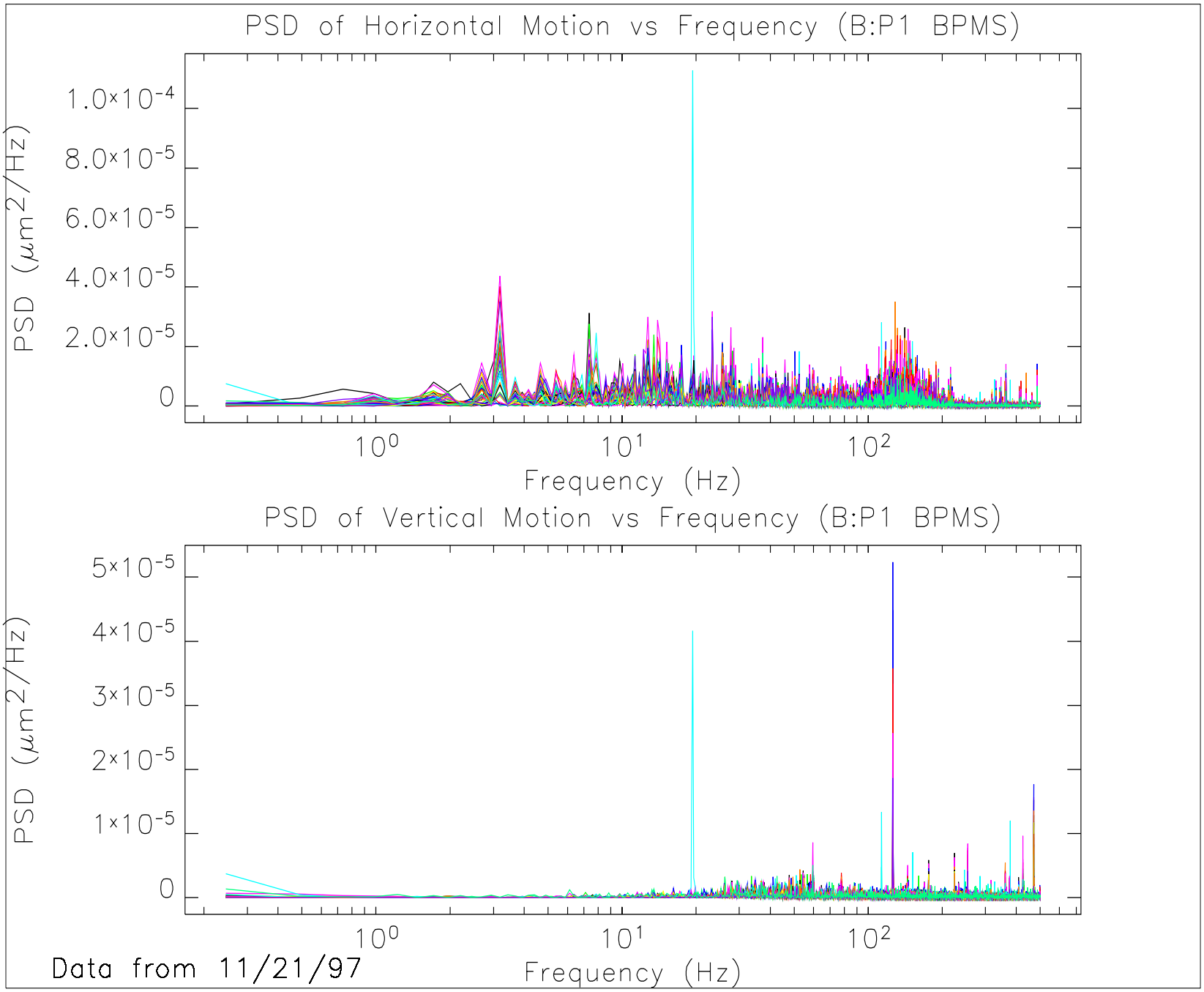


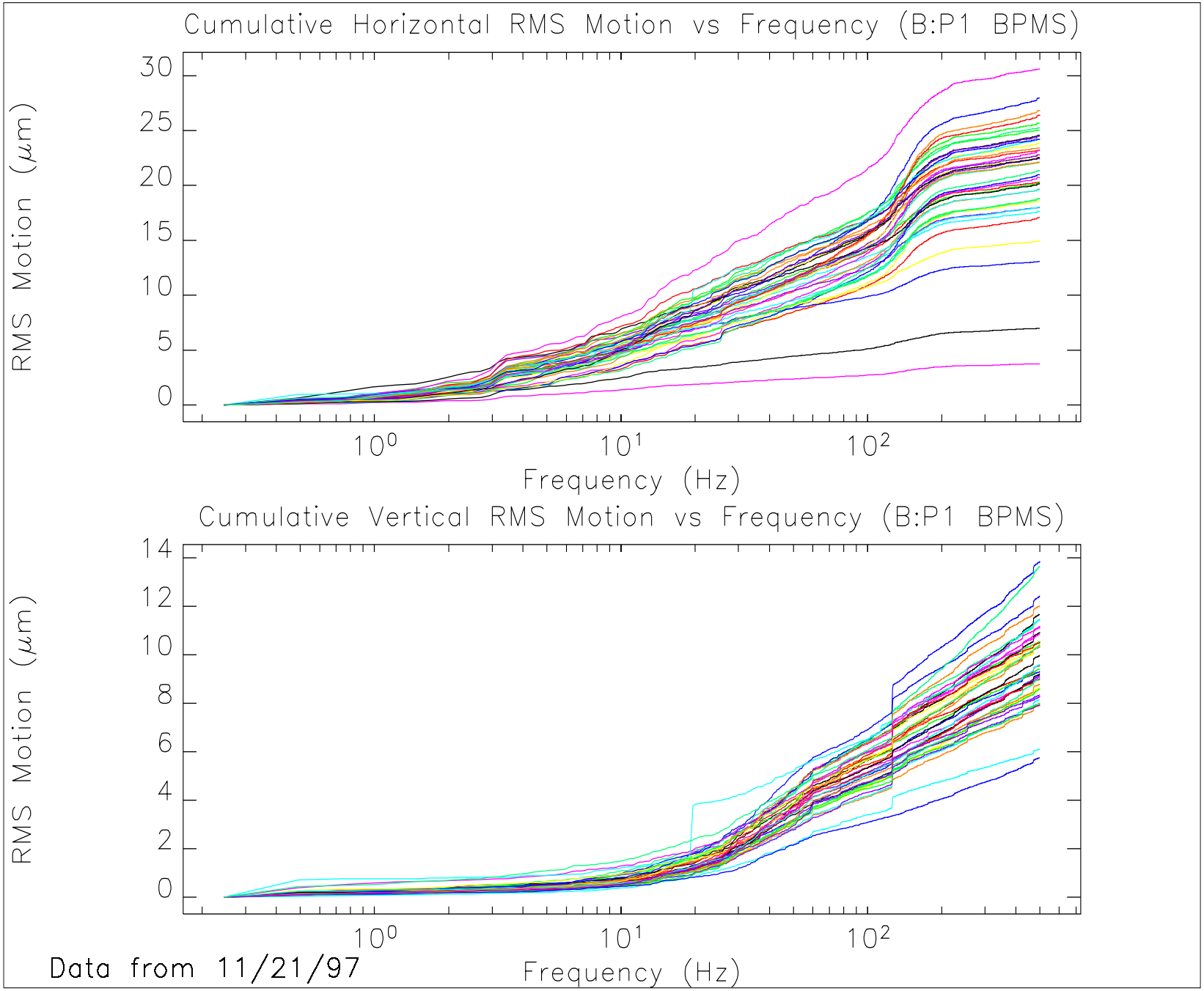
Argonne National Laboratory
Advanced Photon Source
ASD Diagnostics

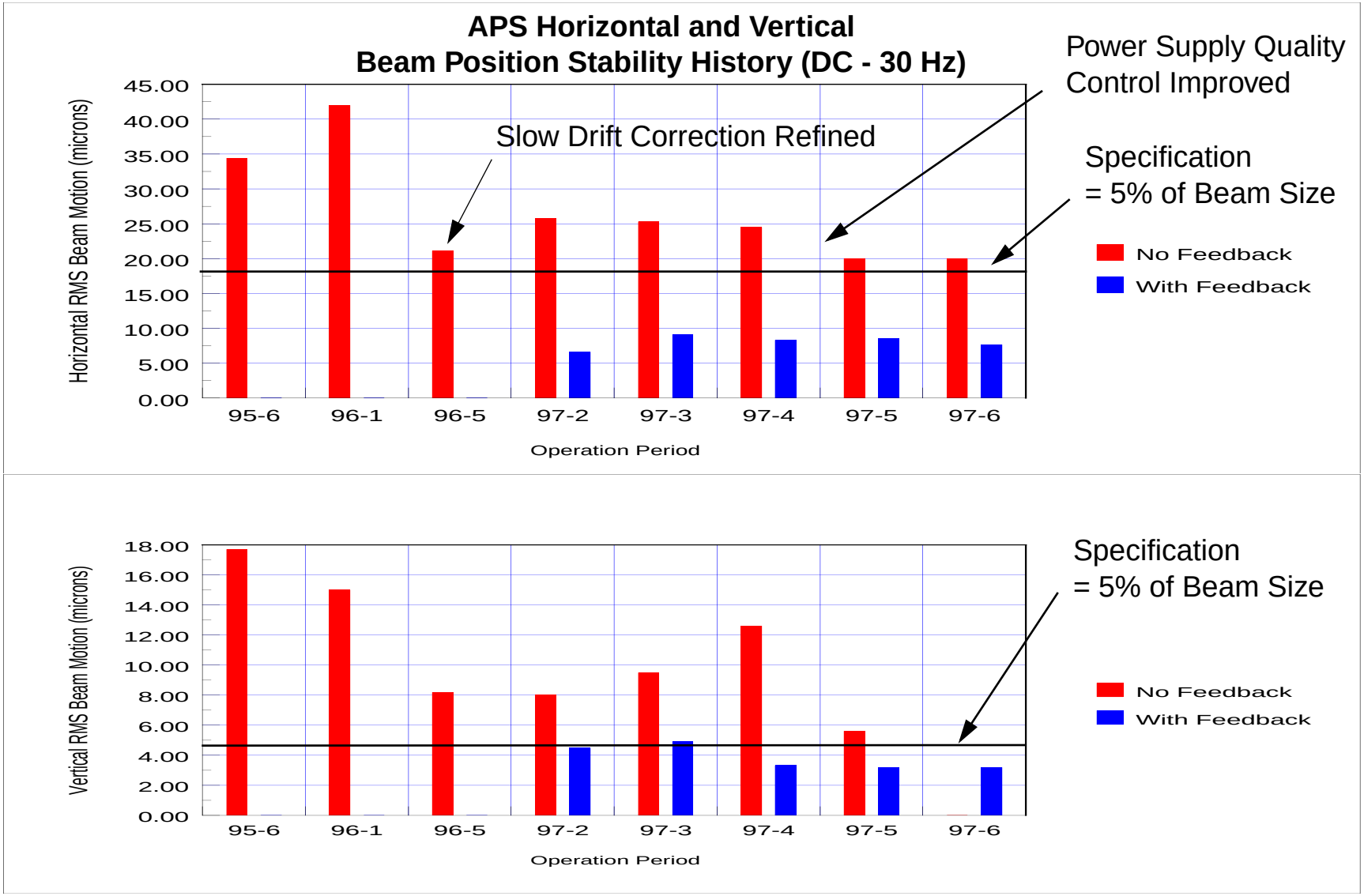
Advanced Photon Source

PAC '97
Glenn Decker
May 13, 1997

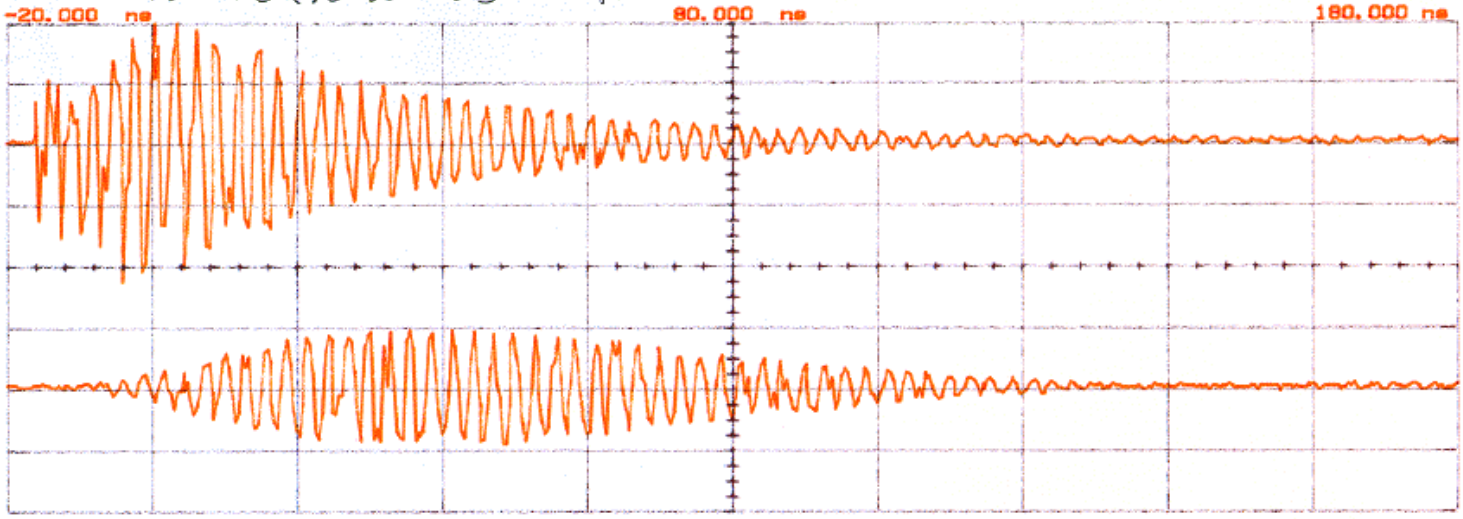

Vertical Mean PSD at Insertion Device Source Points
PSD (mm²/Hz)
10⁰
10⁻¹
10⁻²
10⁻³
10⁻⁴
10⁻⁵
10⁻⁶
10⁻⁷
10⁻⁸
10⁻⁹
10⁻¹⁰
10⁻¹¹
10⁻¹²
real-time feedback off
real-time feedback on
10⁻⁴ 10⁻³ 10⁻² 10⁻¹ 10⁰ 10¹ 10² 10³ 10⁴
frequency (Hz)
data from 1/11/97 3/04/97 5/4/97


PSD of Horizontal Motion vs Frequency (B:P1 BPMS)
PSD (μm^2/Hz)
1.0×10-4
8.0×10-5
6.0×10-5
4.0×10-5
2.0×10-5
0
10^0
10^1
10^2
Frequency (Hz)
PSD of Vertical Motion vs Frequency (B:P1 BPMS)
PSD (μm^2/Hz)
5×10-5
4×10-5
3×10-5
2×10-5
1×10-5
0
10^0
10^1
10^2
Frequency (Hz)
Data from 11/21/97


Cumulative Horizontal RMS Motion vs Frequency (B:P1 BPMS)
RMS Motion (μm)
30
25
20
15
10
5
0
10^0
10^1
10^2
Frequency (Hz)
Cumulative Vertical RMS Motion vs Frequency (B:P1 BPMS)
RMS Motion (μm)
14
12
10
8
6
4
2
0
10^0
10^1
10^2
Frequency (Hz)
Data from 11/21/97


APS Horizontal and Vertical
Beam Position Stability History (DC - 30 Hz)
Horizontal RMS Beam Motion (microns)
45.00
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Slow Drift Correction Refined
Power Supply Quality
Control Improved
Specification
= 5% of Beam Size
No Feedback
With Feedback
95-6
96-1
96-5
97-2
97-3
97-4
97-5
97-6
Operation Period
Vertical RMS Beam Motion (microns)
18.00
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
Specification
= 5% of Beam Size
No Feedback
With Feedback
95-6
96-1
96-5
97-2
97-3
97-4
97-5
97-6
Operation Period

SENSOR 2 IB273mA 1+25 COMPARE MOD SRF59 WITH LORCH BPF (3)



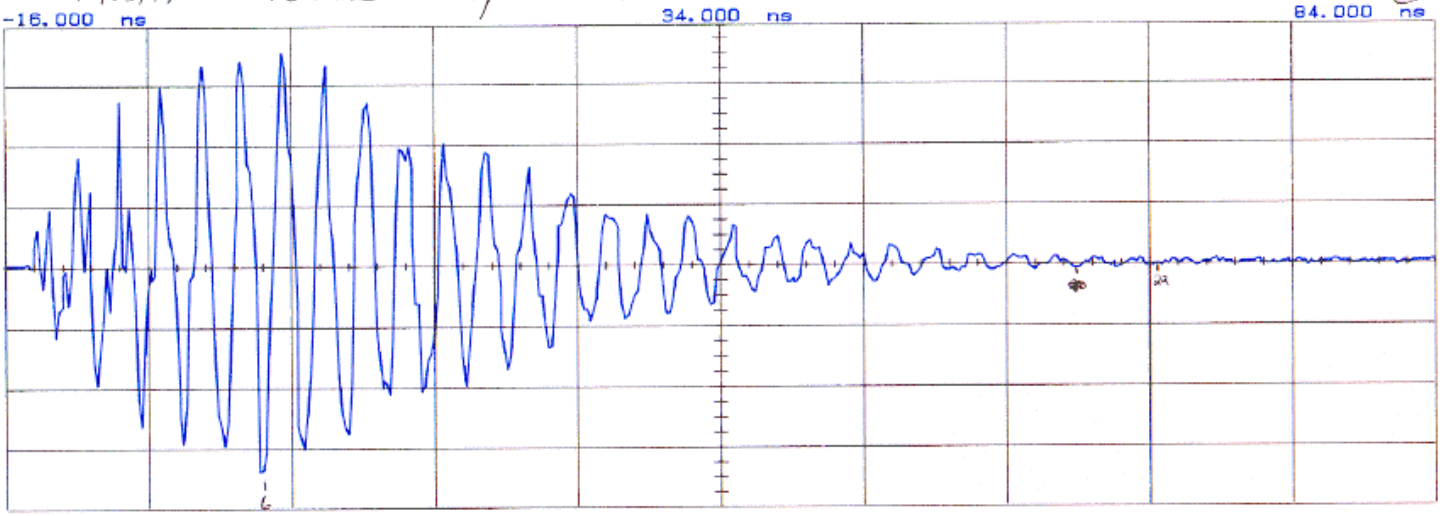
	Timebase	Delay/Pos	Reference
Main	20.0 ns/div	80.000 ns	Center

	Sensitivity	Offset	Probe	Coupling
Channel 1	500 mV/div	-1.00000 V	1.000 :1	dc (50 ohm)
Channel 2	100 mV/div	200.000 mV	1.000 :1	dc (50 ohm)

FSRF 59 INSTALLED ON Button
LORCH T-24 INSTALLED AT SCOPE

Trigger mode : Edge
On Positive Edge Of Chan1
Trigger Level
Chan1 = 500.000 mV (noise reject OFF)
Holdoff = 40.000 ns

16/23/97 16 MHz Cavity I_B = 84 ma (F.P. 6+25 TRIPLES (TRIGGER ON 6) ((1)



	Timebase	Delay/Pos	Reference		
Main	10.0 ns/div	34.000 ns	Center		
	Sensitivity	**Offset**	**Probe**	**Coupling**	
Channel 1	100 mV/div	0.00000 V	1.000 : 1	dc (50 ohm)	

Trigger mode : Edge
On Positive Edge Of Chan1
Trigger Level
Chan1 = 175.000 mV (noise reject OFF)
Holdoff = 40.000 ns

3dB Bw = 16 MHz $Q = 352/16 = 22$

$1/16\,MHz = 62.5\,ns$