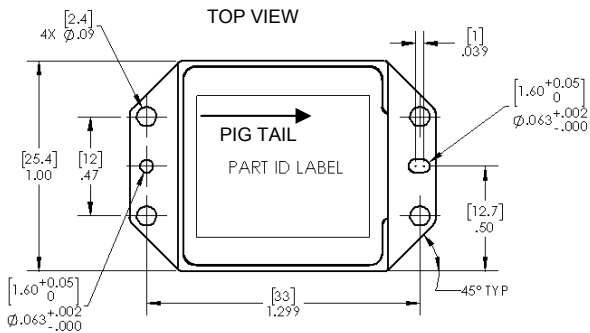
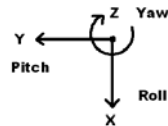


LandMark™ 007 IMU



Axes (Top View)
Right Hand Rule

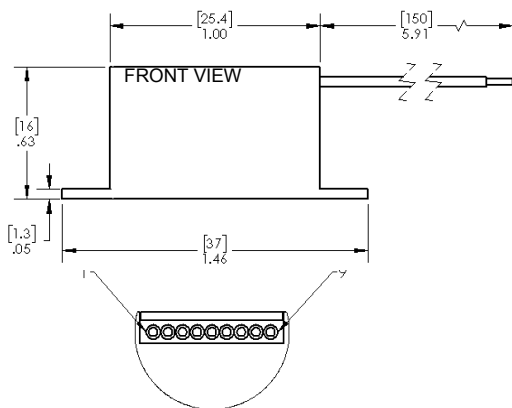


LMRK007 IMU

LMRK007IMU-2000-65-100
LMRK007IMU-490-65-100
LMRK007IMU-2000-65-XXX*

* LMRK007 can use different rate ranges in customer specified axes.

Preliminary Spec



Pin No.	Assignment
1	RS-422/485 A (+) (Twisted Pair)
2	RS-422/485 B (-) (Twisted Pair)
3	Power Ground
4	NC
5	+3.8V to +5.5V Max Input Power
6	External Sync Input (2.5kHz, 3.3V logic)
7	Signal Ground
8	Self Test (3.3V logic)
9	Case

If pin 6 or 8 is not used connect to pin 7.

Outputs	Serial Sequence
1	Roll Gyro (X)
2	Pitch Gyro (Y)
3	Yaw Gyro (Z)
4	Roll Accel (X)
5	Pitch Accel (Y)
6	Yaw Accel (Z)
7	Temperature $\pm 0.5^\circ$ C typical

PARAMETER	RATE AXES	ACCEL AXES
Range	$\pm 490^\circ/\text{sec}$ $\pm 2000^\circ/\text{sec}$	$\pm 65 \text{ g}'\text{s}$
ARW / VRW	0.004° 0.0045° /sec/ $\sqrt{\text{Hz}}$ 1σ 0.17° 0.2° /√hour 1σ	$6.5 \text{ mg}/$ /√Hz 1σ 2.7m/s /√hour 1σ
Bias In-Run Stability	2.5°/hour 10°/hour 1σ	2mg 1σ
Bias Over Temp.	$< 0.05^\circ/\text{sec}$ $< 0.19^\circ/\text{sec}$ 1σ	$\pm 20 \text{ mg}$ 1σ
Scale Factor Error %	$\leq 0.05\%$ 1σ $\leq 0.1\%$ 1σ	$\leq 0.1\%$ 1σ
Sensor Resolution	0.003°/sec 0.01°/sec	2mg
Alignment	$< 0.5 \text{ mrad}$ 1σ	4 mrad 1σ
G-Sensitivity	0.001 0.003 °/sec/g 1σ	0.4 mg/g ² 1σ
Output Data Rate	2.5k Hz	
Bandwidth	250 hz	1.25k Hz
Self Test On	$\Delta 150^\circ/\text{s}$ $0 \pm 15^\circ/\text{s}$	$\Delta 4$ $\pm 2.5 \text{ g}$
Temp Range	Operating: -40°C to $+85^\circ \text{C}$ Non-Operating: -55°C to $+85^\circ \text{C}$	
Start-up Time	$< 0.3 \text{ sec}$	
Input Power	+3.8V to +5.5V Max. Input (single sided)	
Power Consumption	180 mW at 4.5V Typical 230mW at 4.5V Maximum	
U.S.:	1.09 x 0.969 x 0.63 = 0.67 in ³	
Metric:	2.8 x 2.46 x 1.6 = 11 cm ³	
Weight	$\leq 25 \text{ grams}$	
Mounting	4ea No.2-56 Screws	
Shock	500g's ½ sine 1 msec powered	
Vibration	15gRMS (20Hz to 2KHz)	
MTBF	93,636 hrs (per MIL-STD-217F, Notice 2 and ANSI/VITA 51.1-2008 with environment: ACI at 40°C Ambient)	

Specification subject to change without notice

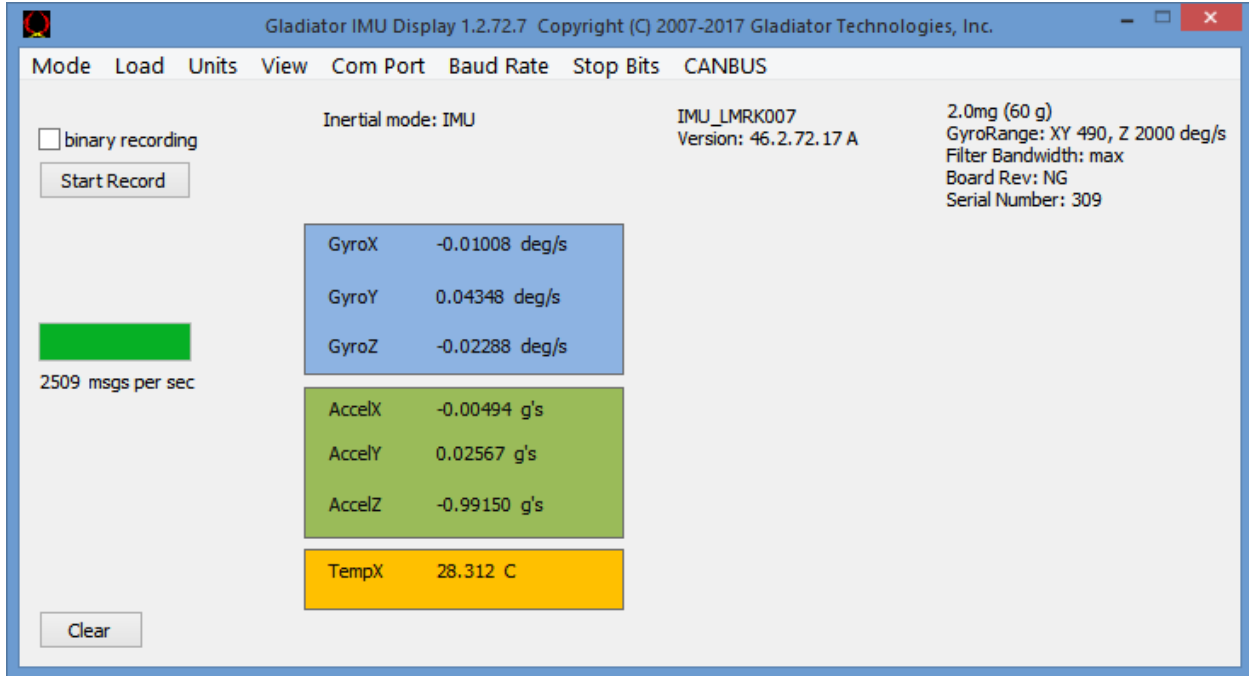


Gladiator Technologies

Division of LKD Aerospace

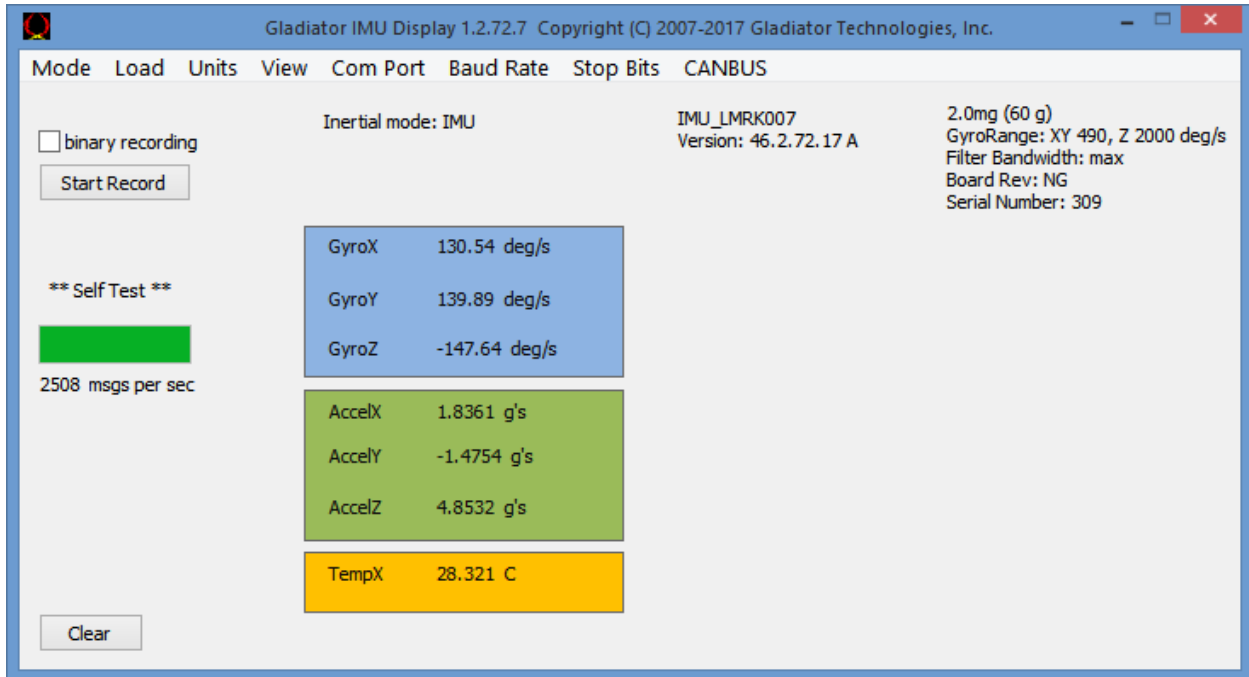
Low Noise Inertial MEMS

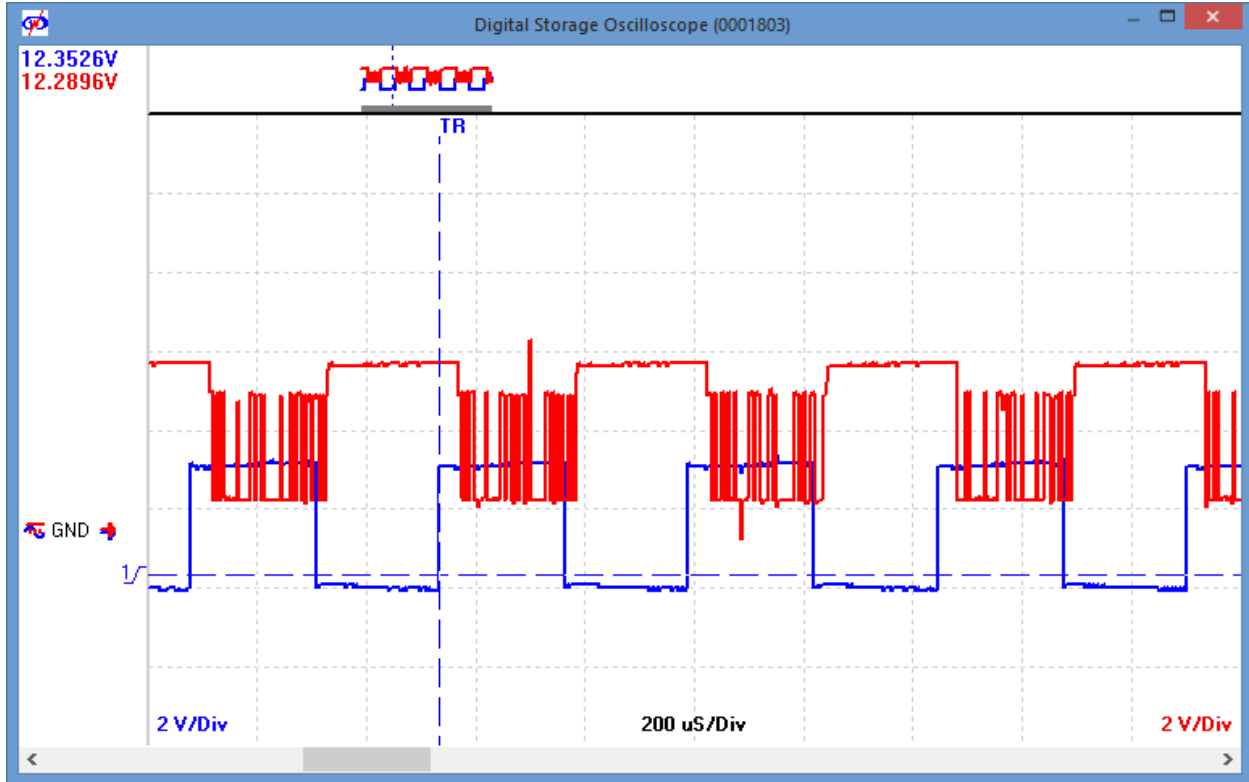
Rev. 17May24
SN: 300



Initial Bench Readout (above)

Self Test (below)





Gladiator IMU Display 1.2.72.7 Copyright (C) 2007-2017 Gladiator Technologies, Inc.

Mode Load Units View Com Port Baud Rate Stop Bits CANBUS

binary recording
Start Record

Inertial mode: IMU
EXT_SYNC

IMU_LMRK007
Version: 46.2.72.17 A

2.0mg (60 g)
GyroRange: XY 490, Z 2000 deg/s
Filter Bandwidth: max
Board Rev: NG
Serial Number: 309

GyroX	-0.01383 deg/s
GyroY	0.07137 deg/s
GyroZ	-0.04766 deg/s

AccelX	0.01602 g's
AccelY	0.03500 g's
AccelZ	-0.99651 g's

TempX 28.371 C

2193 msgs per sec

Clear





LMRK007IMU-2000-65-100
 Rate Spin Test

SN309 ATP

7/14/2017

Test	gyroX	gyroY	gyroZ	accelX	accelY	accelZ	temp X
PX	143.9993	-0.00222	-0.01092	3.596	40.334	-8.434	2567.199
NX	-143.9965	0.01523	0.00132	5.108	26.044	-9.956	2565.725
Diff/2	143.9979	-0.008725	-0.00612	-0.756	7.145	0.761	0.737
Ave	0.001385	0.006505	-0.0048	4.352	33.189	-9.195	2566.462
PY	-0.06674	144.0065	-0.0072	21.634	-1.384	0.914	2563.166
NY	0.05681	-143.9992	-0.00126	36.944	-1.288	0.534	2562.642
Diff/2	-0.061775	144.0028	-0.00297	-7.655	-0.048	0.19	0.262
Ave	-0.004965	0.003625	-0.00423	29.289	-1.336	0.724	2562.904
PZ	-0.01209	0.01447	144.0027	37.94	30.048	3.494	2494.992
NZ	0.00409	-0.01099	-144.0182	23.524	30.062	1.368	2511.05
Diff/2	-0.00809	0.01273	144.0105	7.208	-0.007	1.063	-8.029
Ave	-0.004	0.00174	-0.007765	30.732	30.055	2.431	2503.021
RSF Norm	0.999985	1.00002	1.000073				Temp °C 25.44

Gyro Mis-Align deg/sec			Input Rate	
x		-0.0618	-0.0081	x
y	-0.0087		0.0127	y
z	-0.0061	-0.0030		z

Gyro Mis-align mrad			Input Rate	
x		-0.429	-0.056	x
y	-0.061		0.088	y
z	-0.042	-0.021		z



Accepted by:



LMRK007IMU-2000-65-100
 Accelerometer Tumble Test

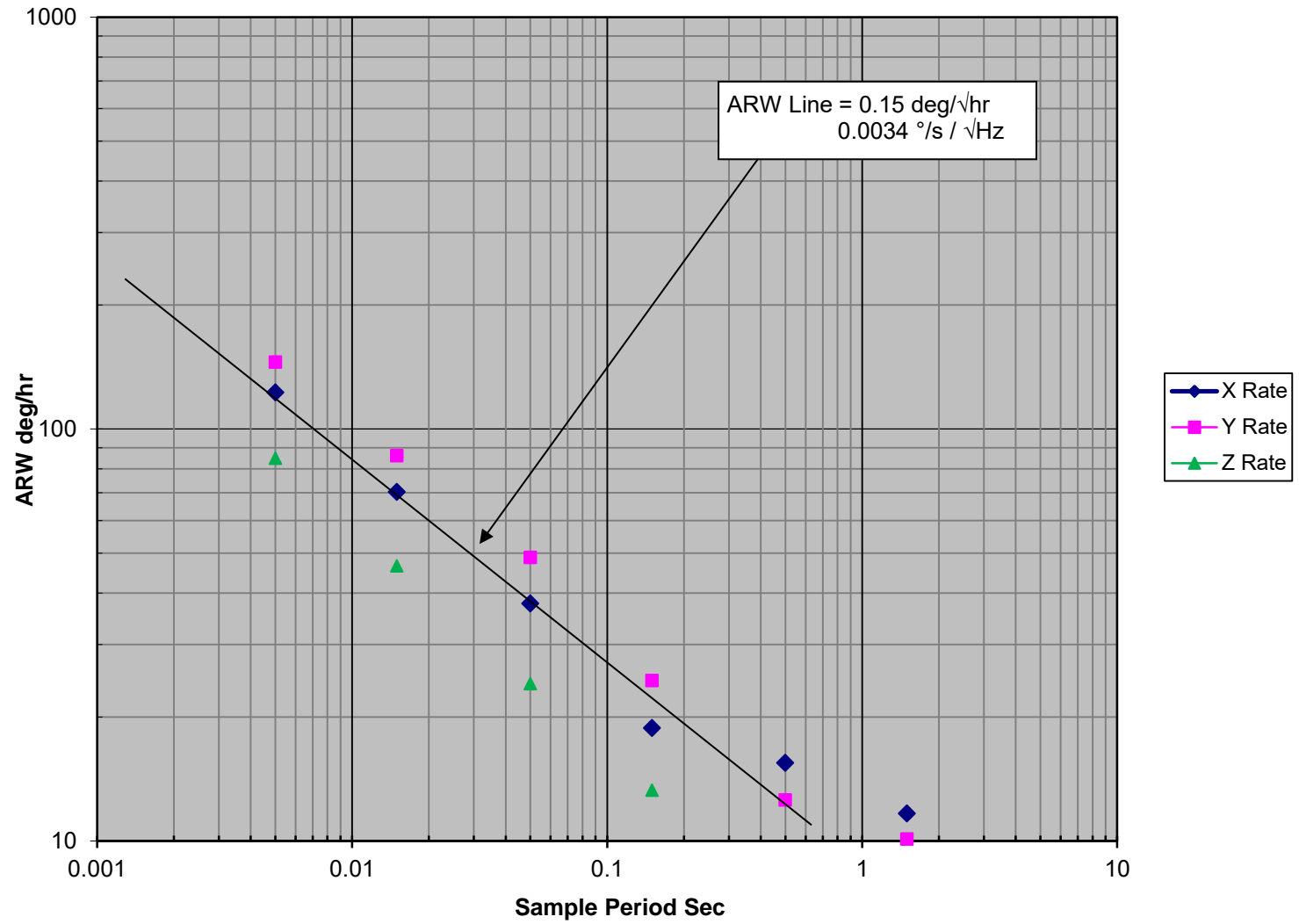
Test	gyroX	gyroY	gyroZ	accelX	accelY	accelZ	temp X
PX	-0.00589	0.00451	-0.00186	1056.386	-4.85	12.542	2562.792
NX	-0.00455	0.00319	-0.00078	-946.56	-3.112	9.54	2561.676
Diff/2	-0.00067	0.00066	-0.00054	1001.473	-0.869	1.501	0.558
Ave	-0.00522	0.00385	-0.00132	54.913	-3.981	11.041	2562.234
PY	-0.00067	0.00302	-0.00162	3.492	1041.622	-5.186	2570.477
NY	-0.00062	0.00245	-0.0021	4.634	-961.766	-7.314	2569.08
Diff/2	-2.5E-05	0.000285	0.00024	-0.571	1001.694	1.064	0.6985
Ave	-0.000645	0.002735	-0.00186	4.063	39.928	-6.25	2569.779
PZ	-0.00084	0.00486	-0.00144	1.094	-0.652	1042.188	2569.738
NZ	0.00182	0.00046	-0.0009	1.303	-1.399	-958.895	2570.297
Diff/2	-0.00133	0.0022	-0.00027	-0.1045	0.3735	1000.542	-0.2795
Ave	0.00049	0.00266	-0.00117	1.1985	-1.0255	41.6465	2570.018
Bias %s,mg	-0.0018	0.0031	-0.0015	2.63	-2.50	2.40	25.67
ASF Norm				1.0015	1.0017	1.0005	Temp °C

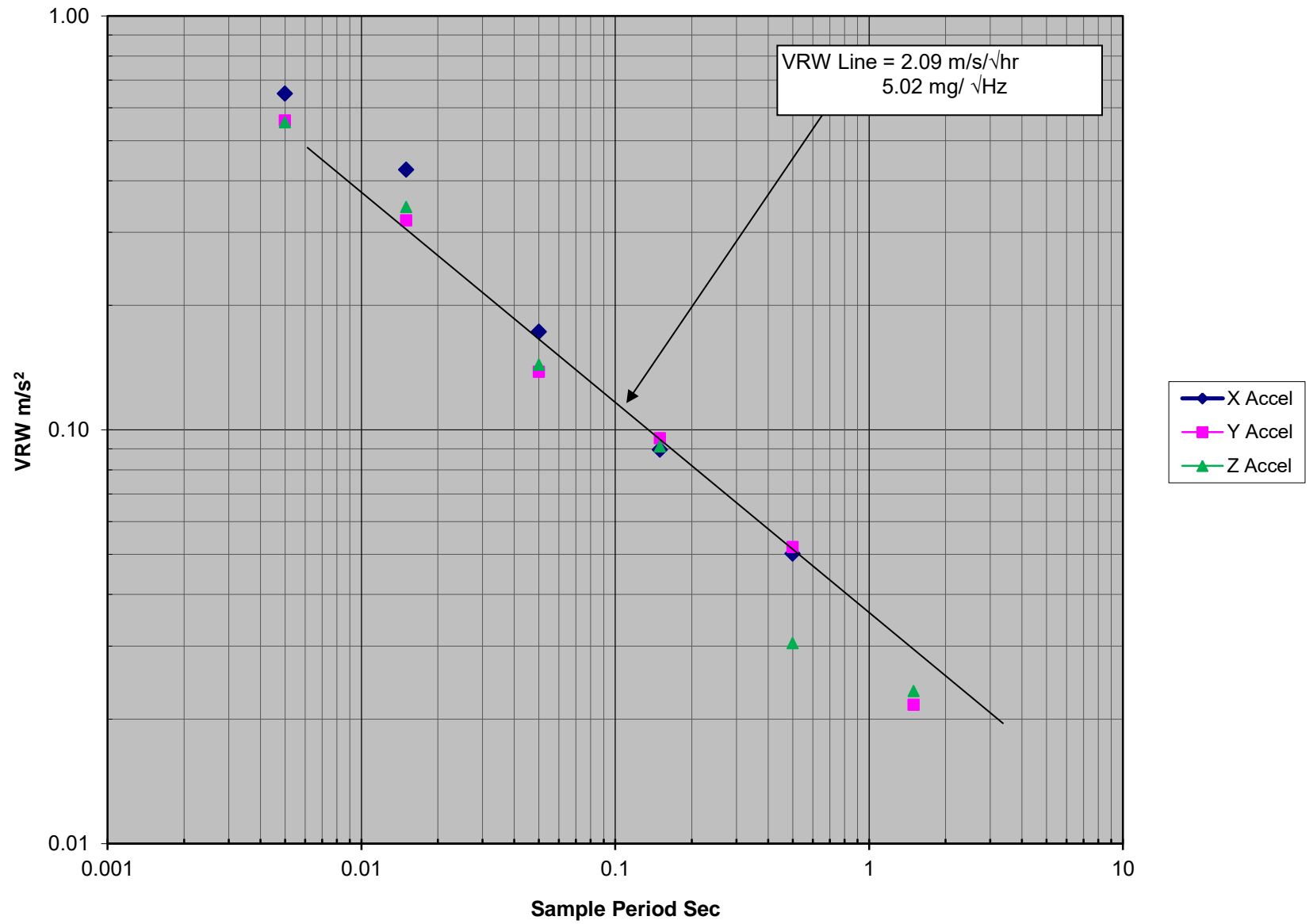
Gyro %s /g	Input g =			Accel In g's
x	-0.0007	0.0000	-0.0013	x
y	0.0007	0.0003	0.0022	y
z	-0.0005	0.0002	-0.0003	z

Accel		Accel In
Mis-Align	mrads	
-0.57	-0.10	x
-0.87	0.37	y
1.50	1.06	z

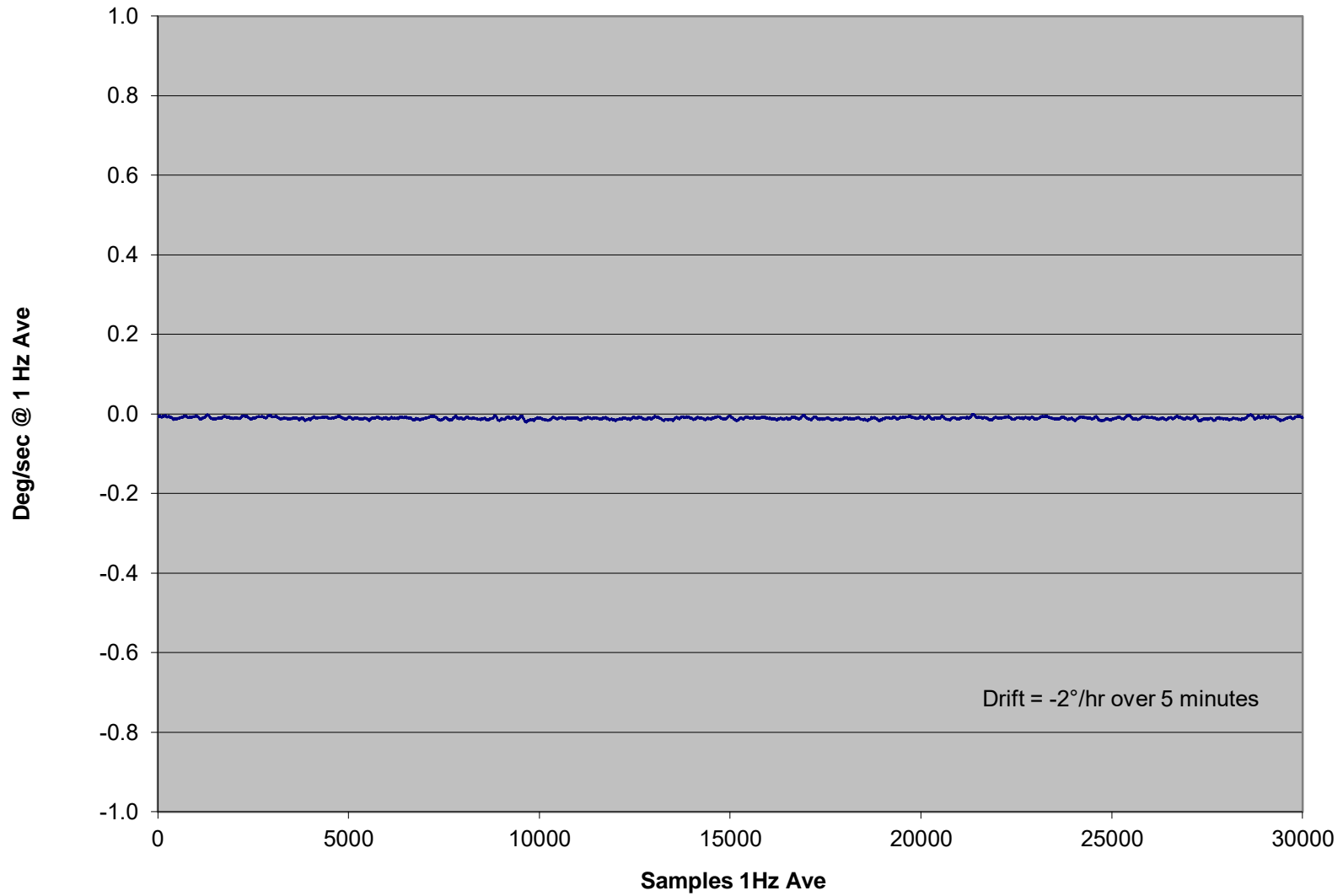


Accepted by:

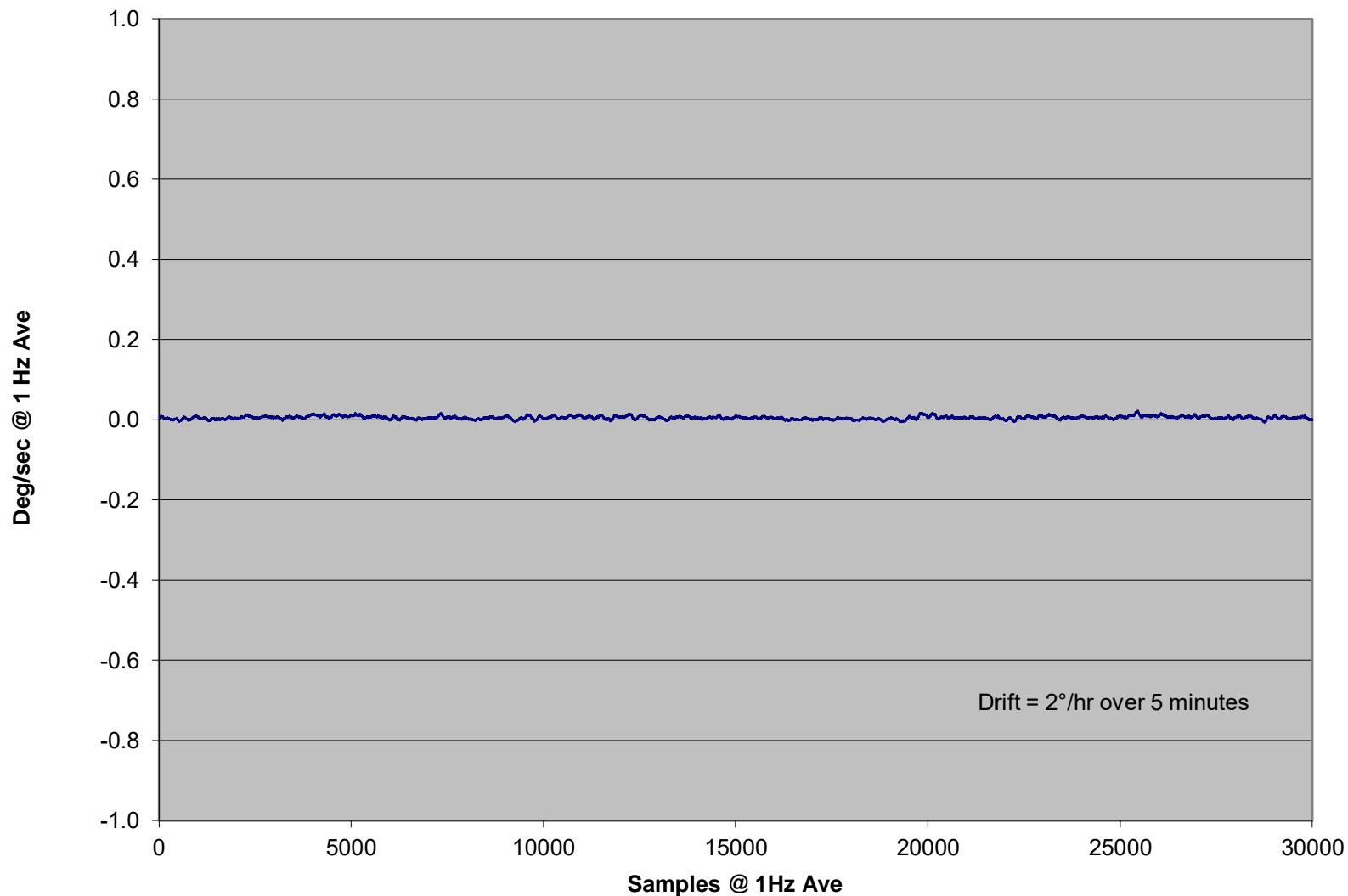




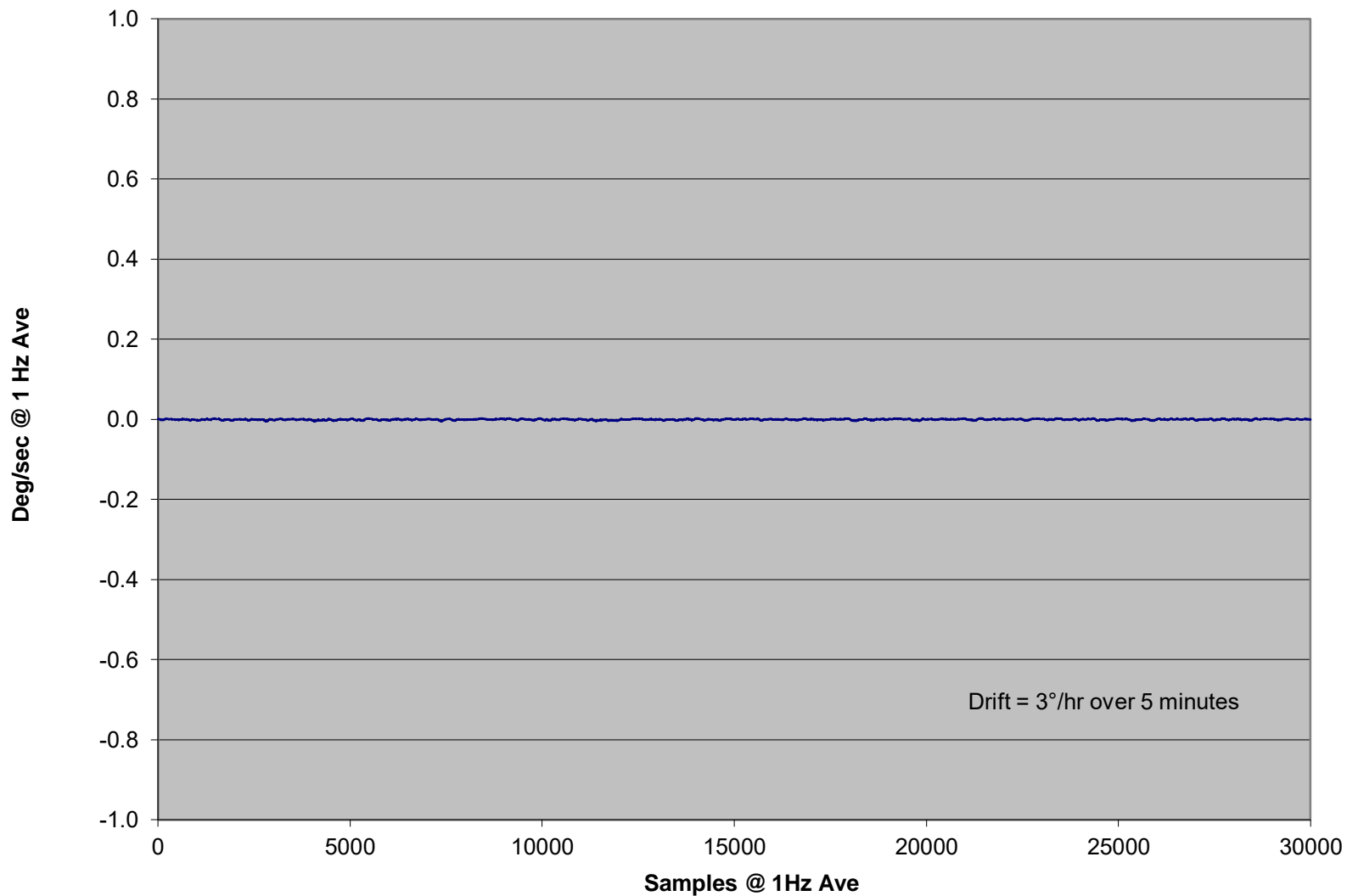
X Gyro In-Run Bias



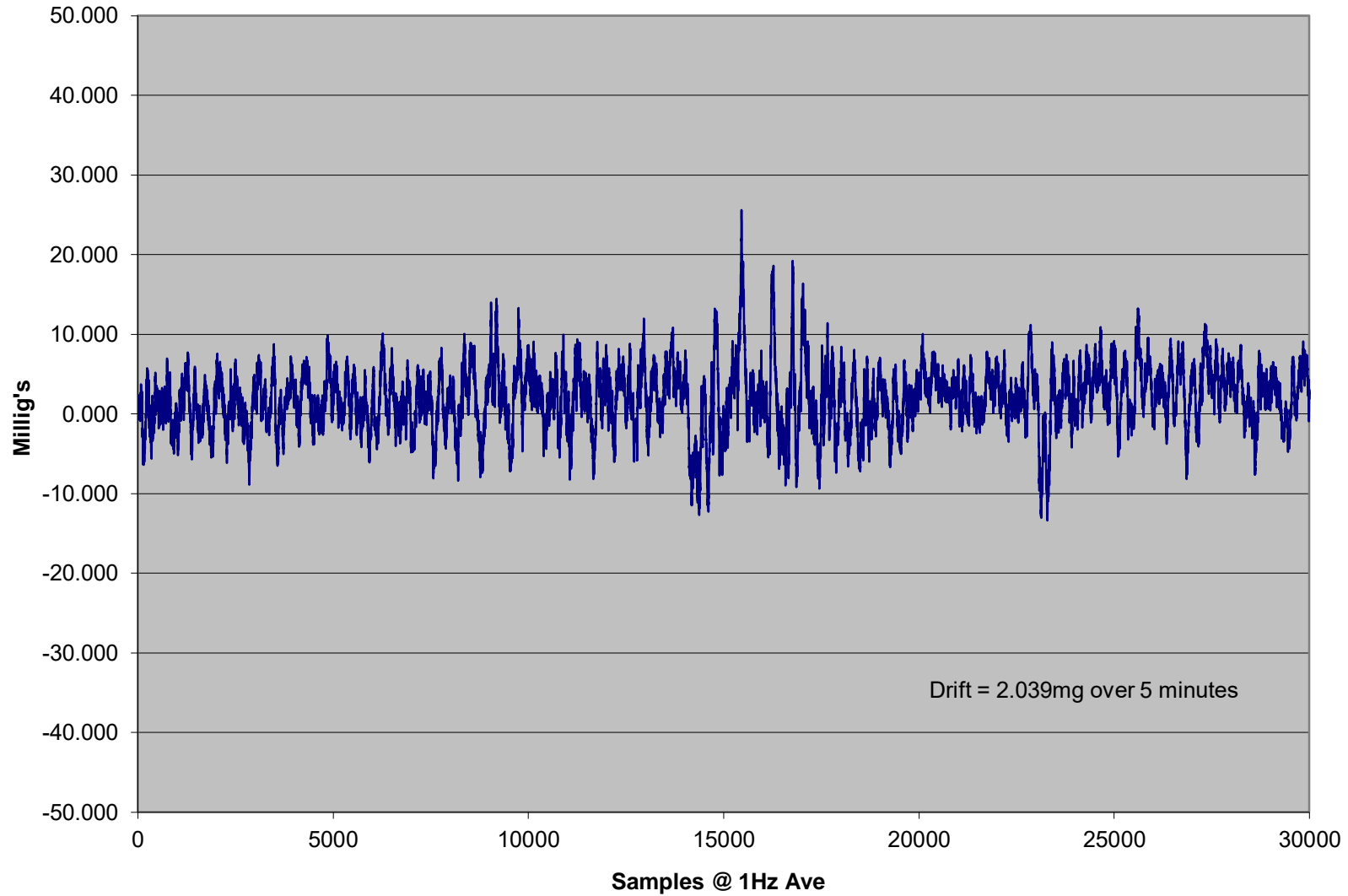
Y Gyro In-Run Bias



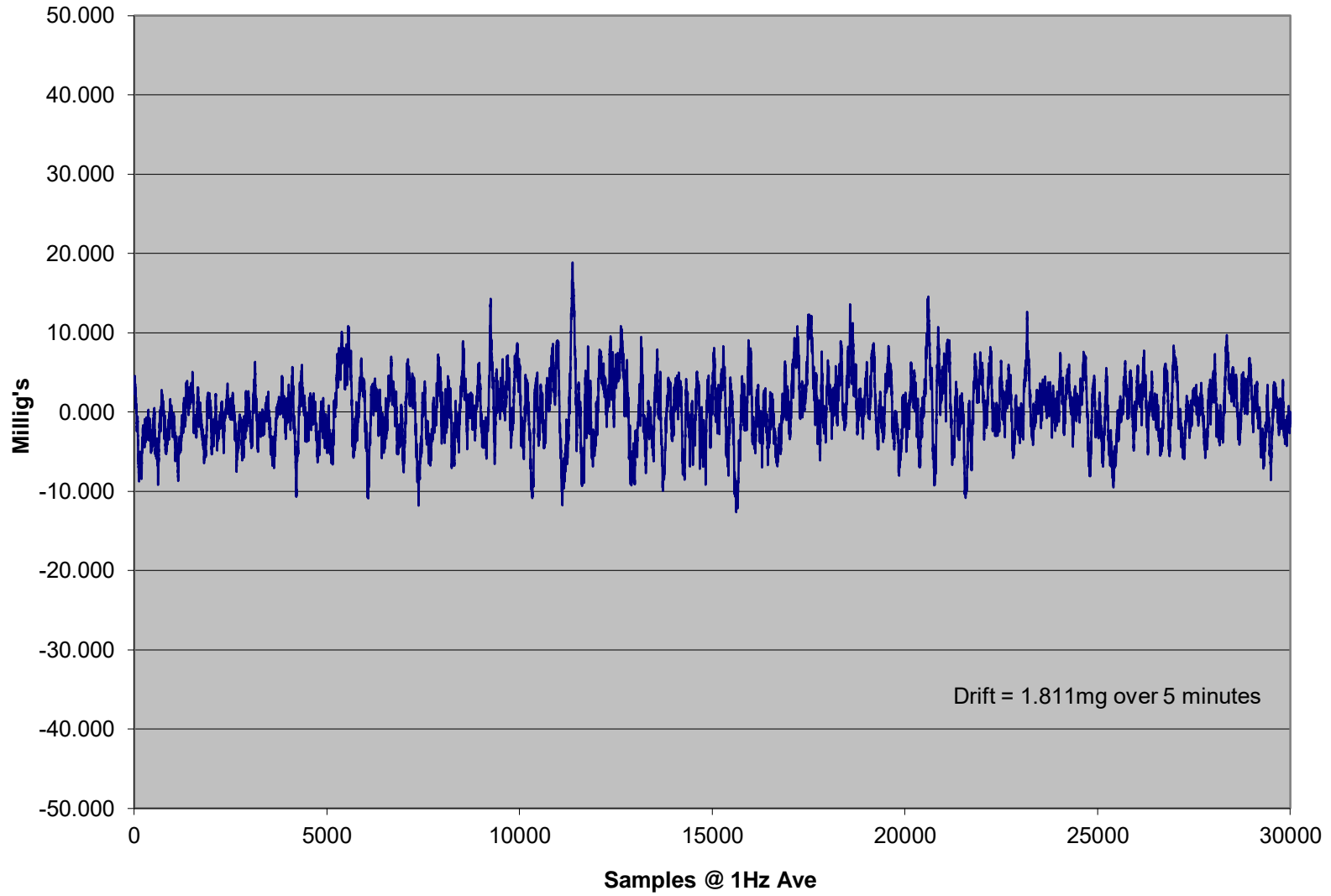
Z Gyro In-Run Bias



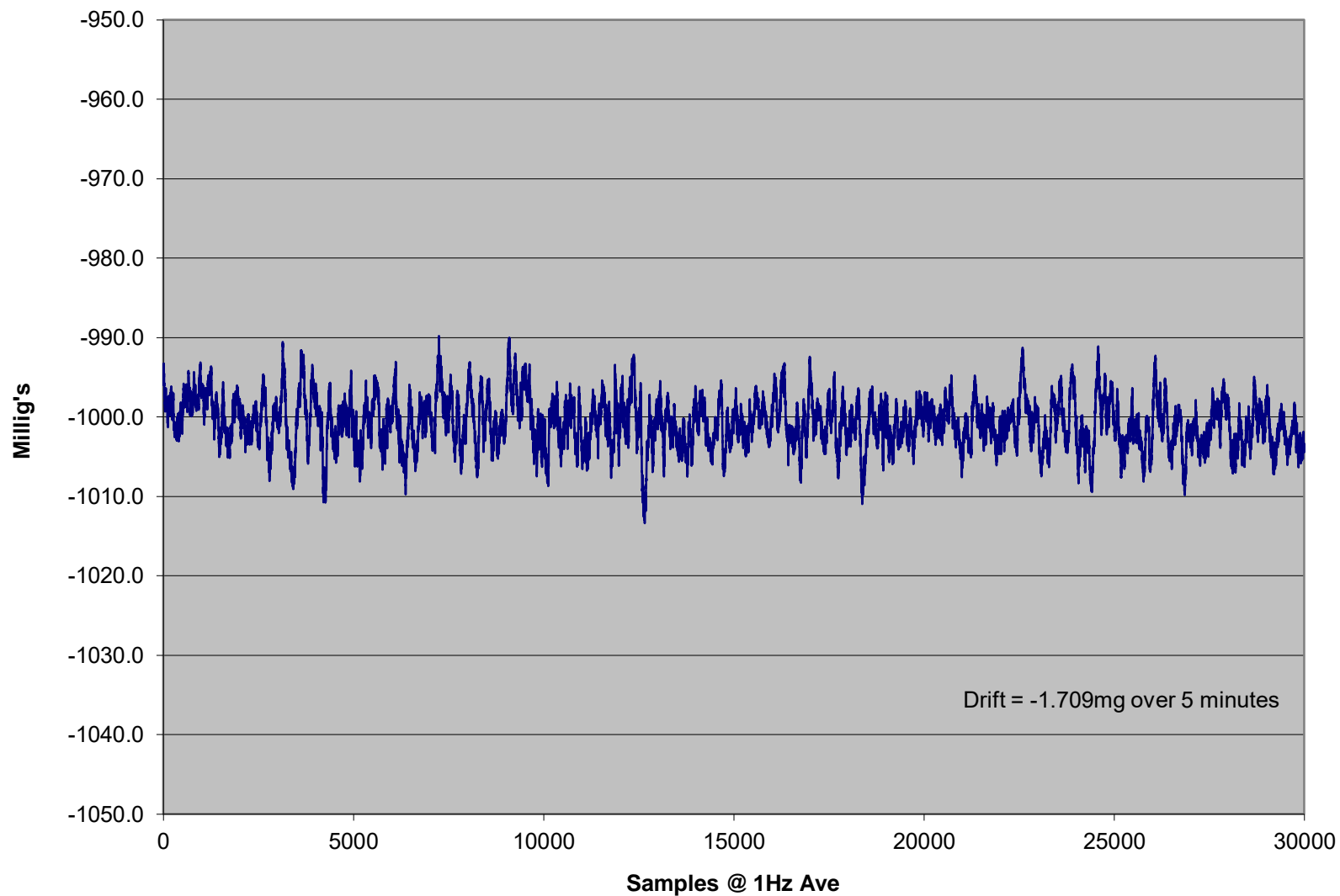
X Accel In-Run



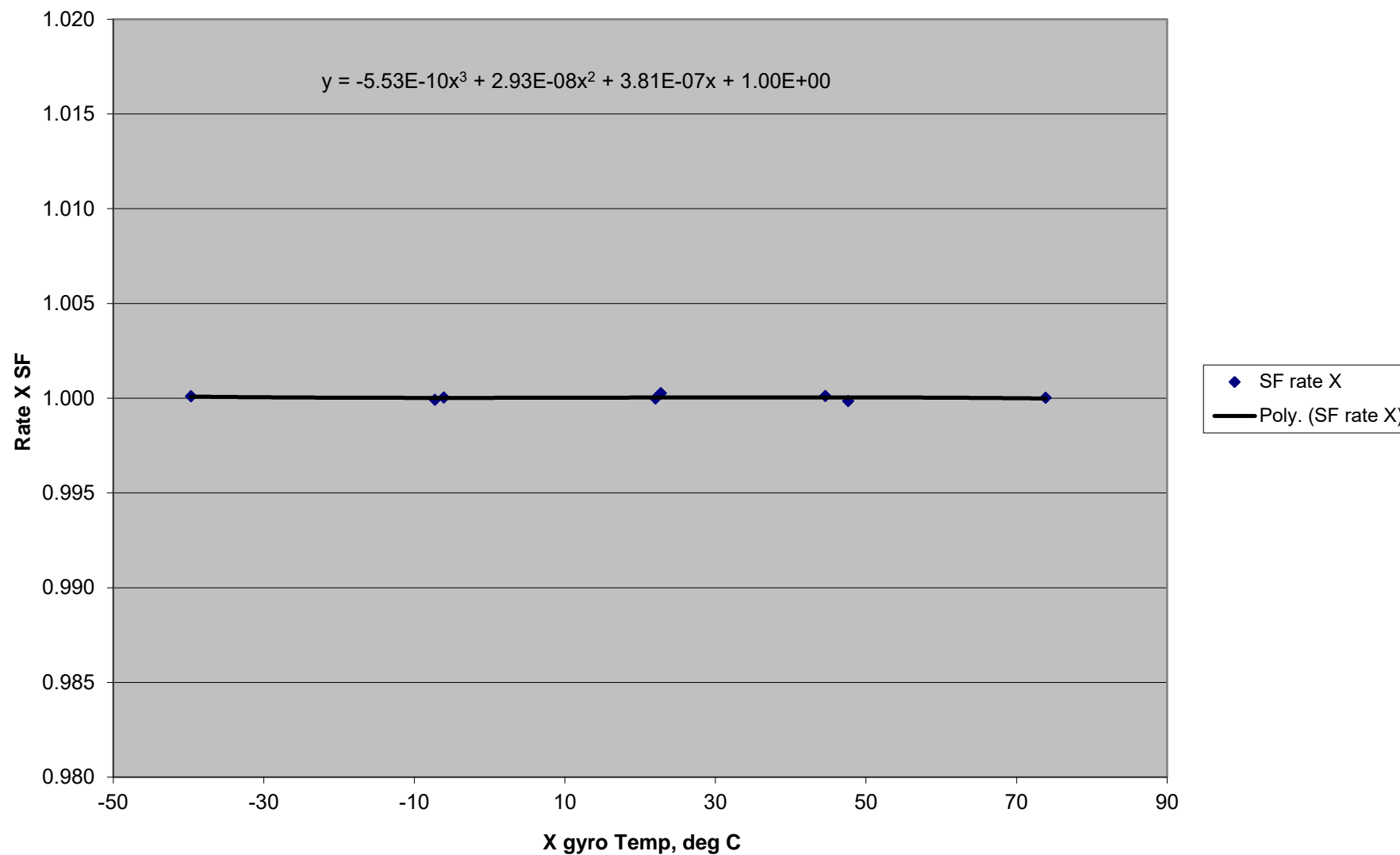
Y Accel In-Run



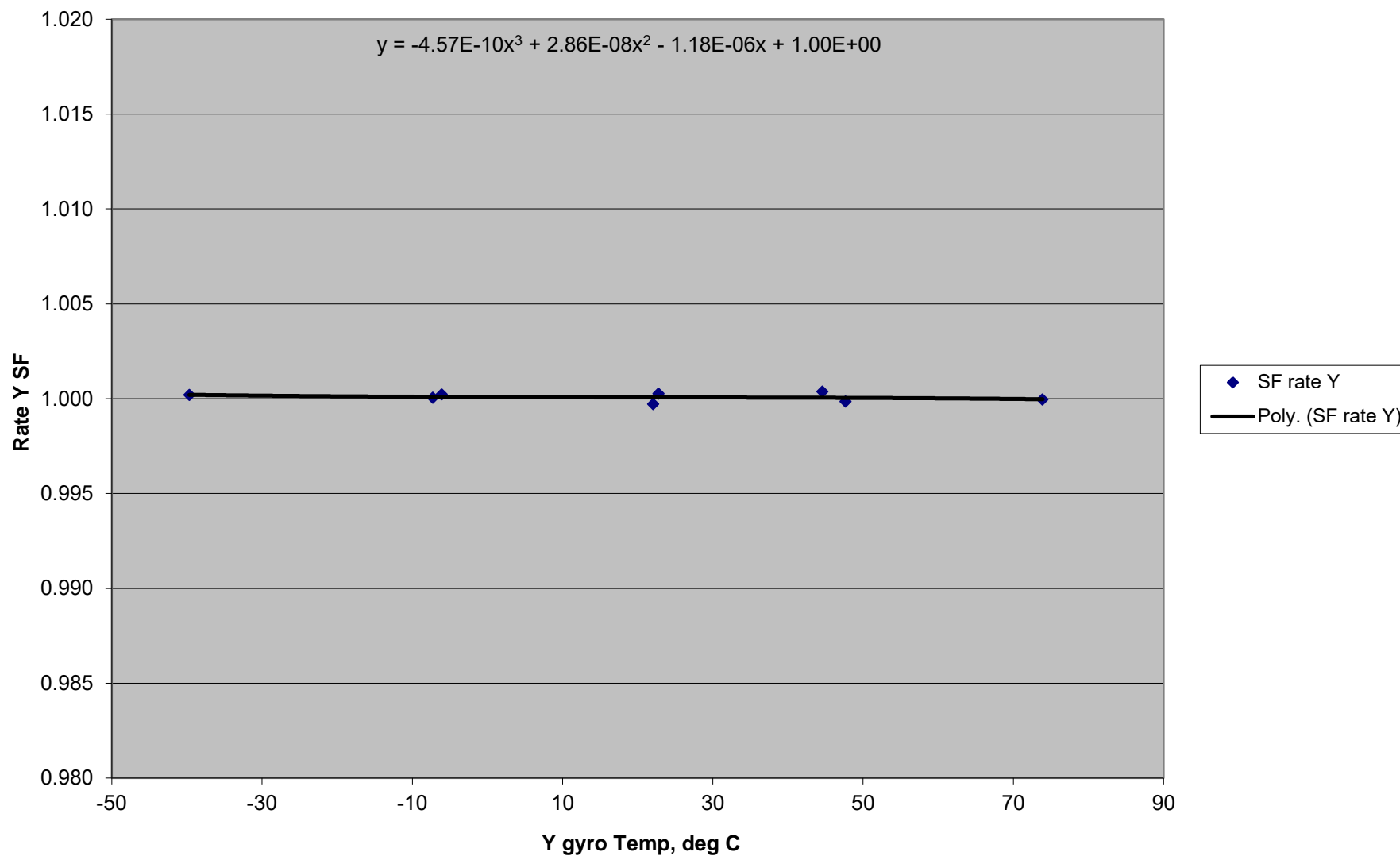
Z Accel In-Run



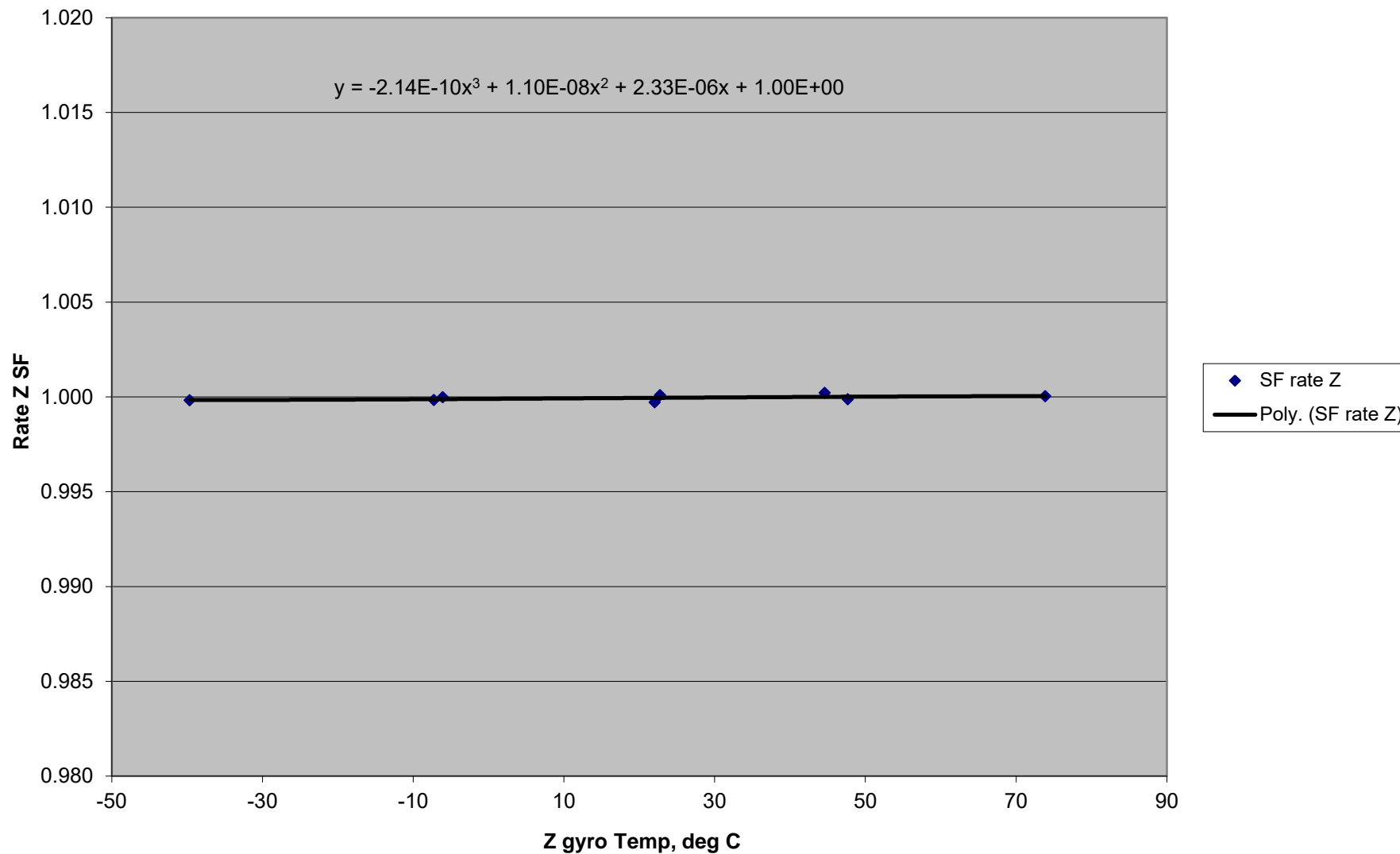
Rate X



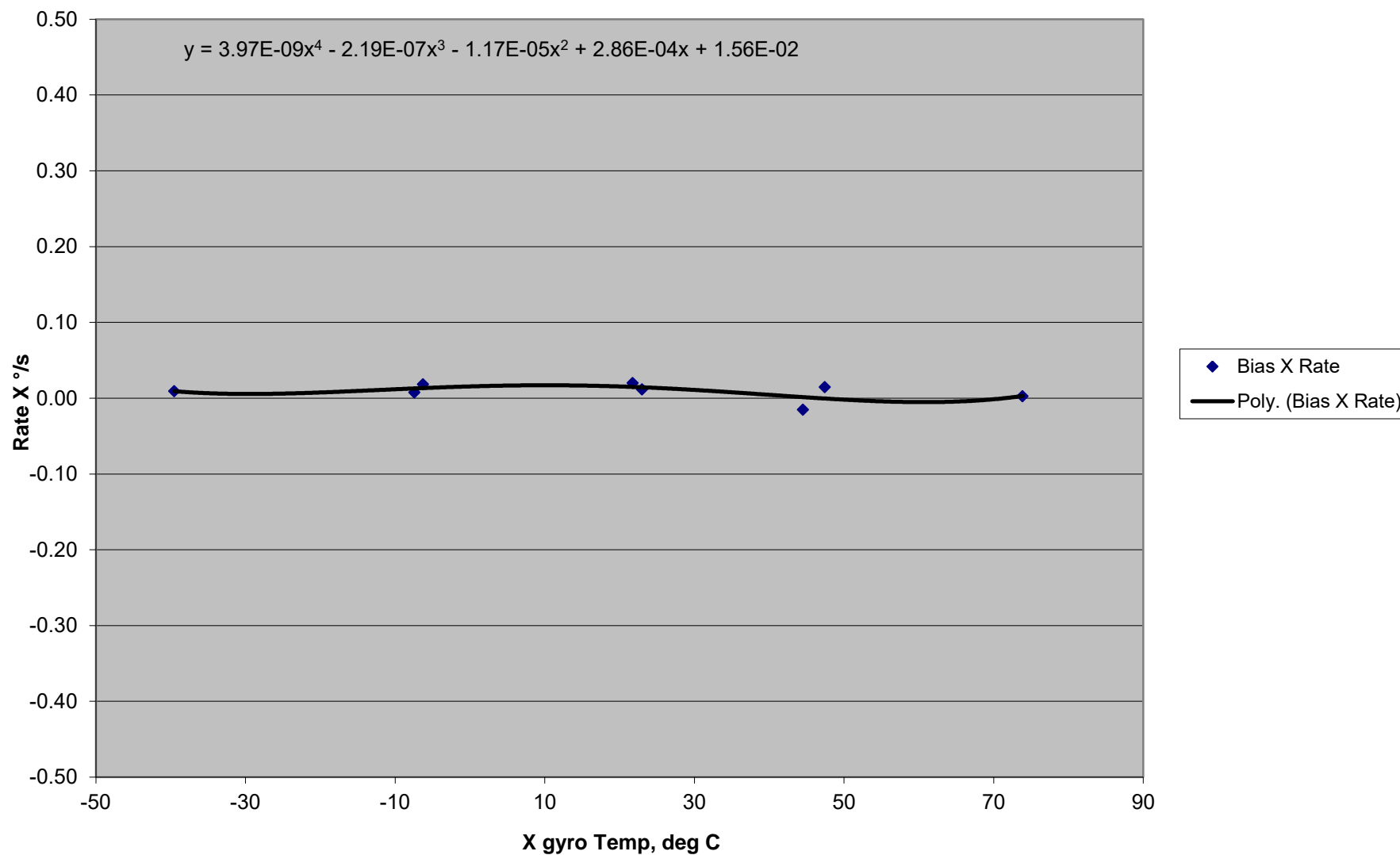
Rate Y



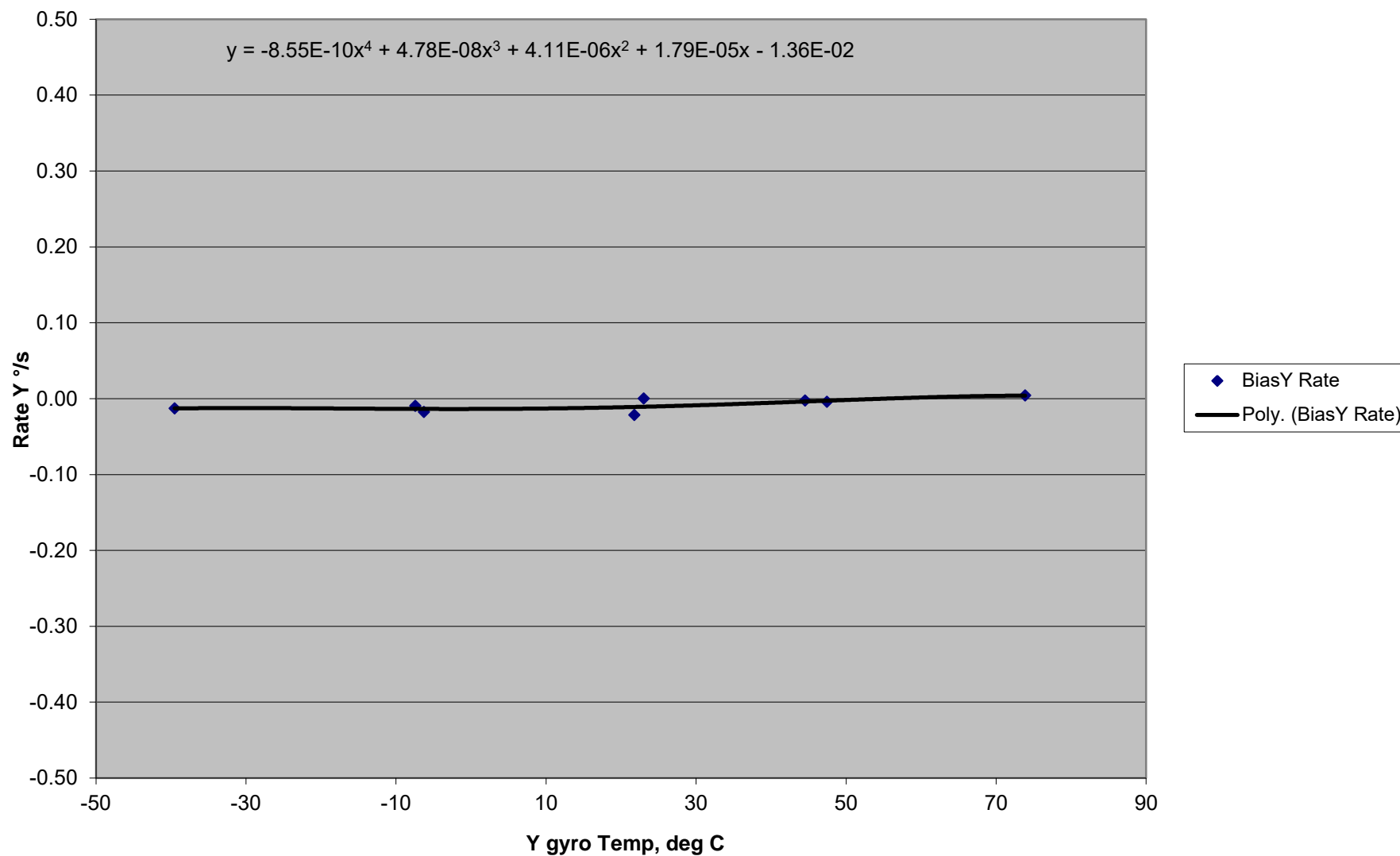
Rate Z



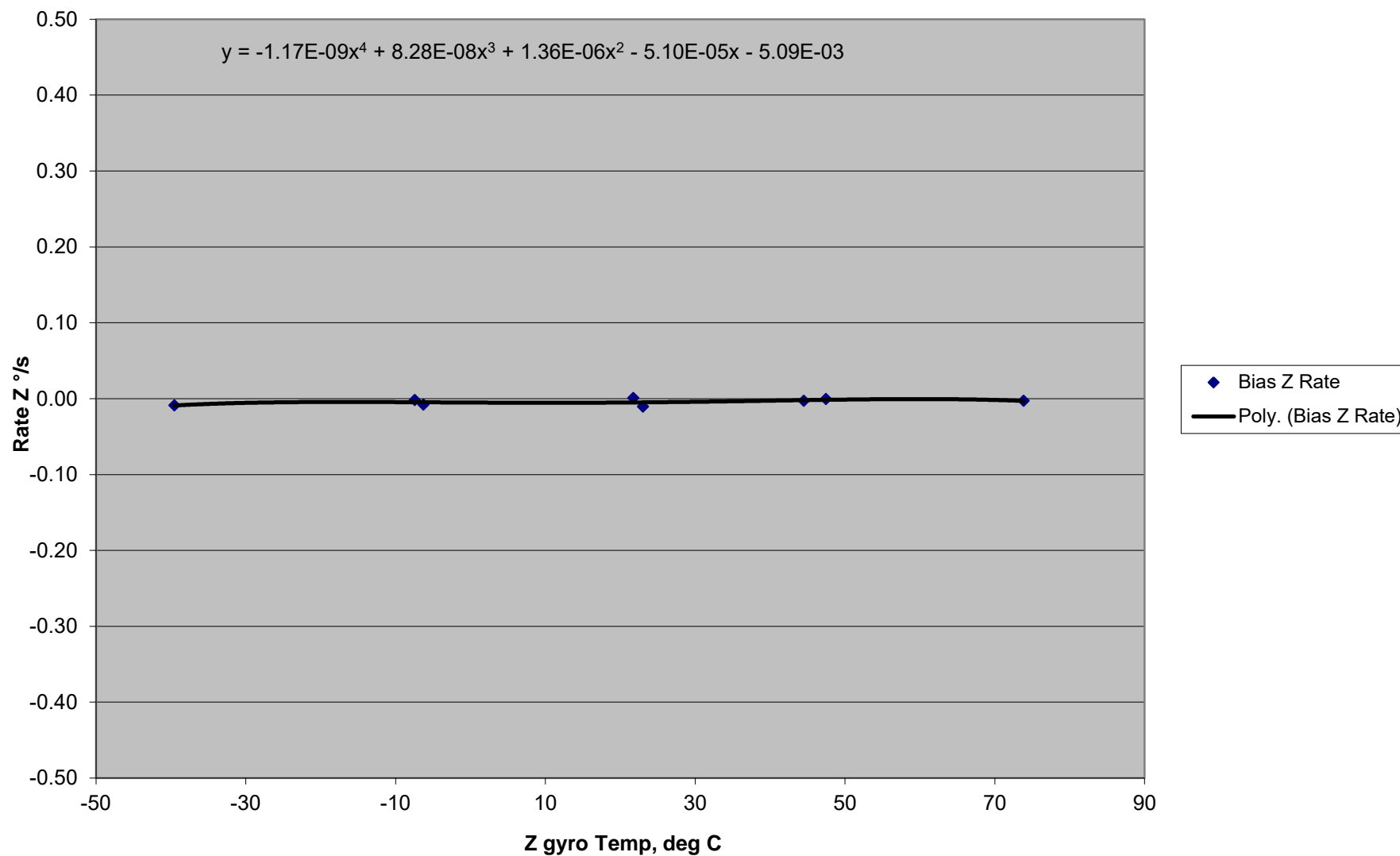
Rate X



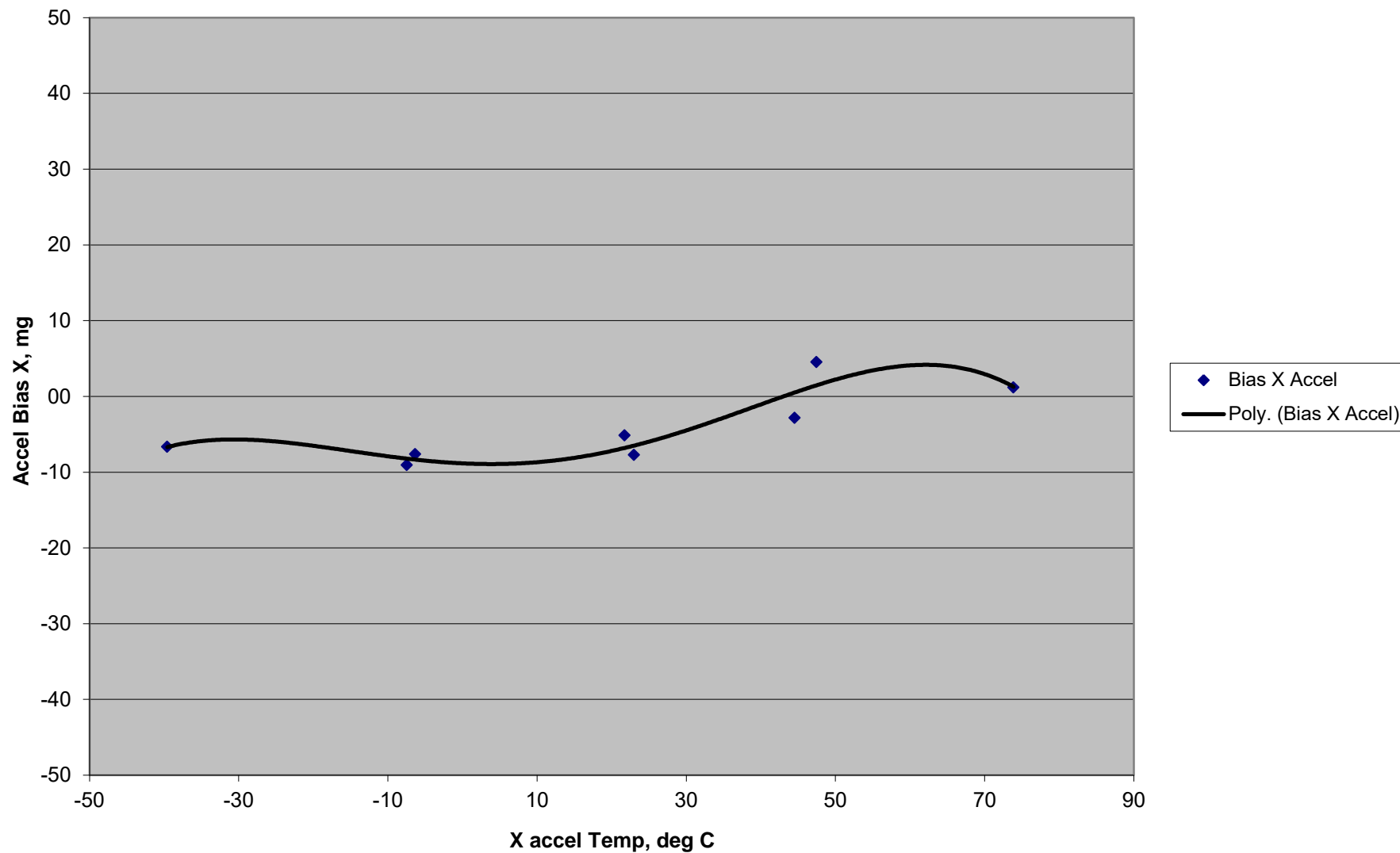
Rate Y



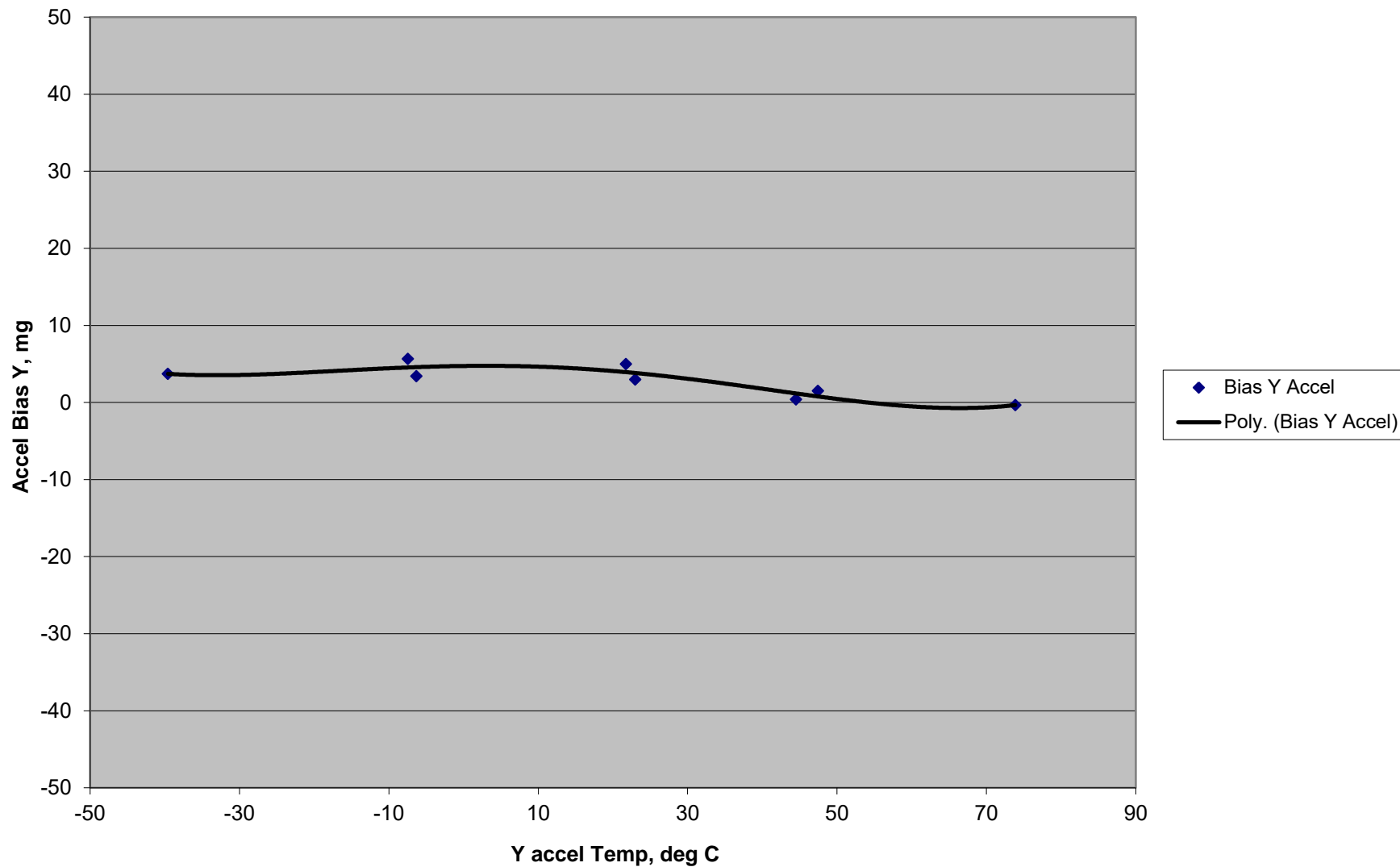
Rate Z



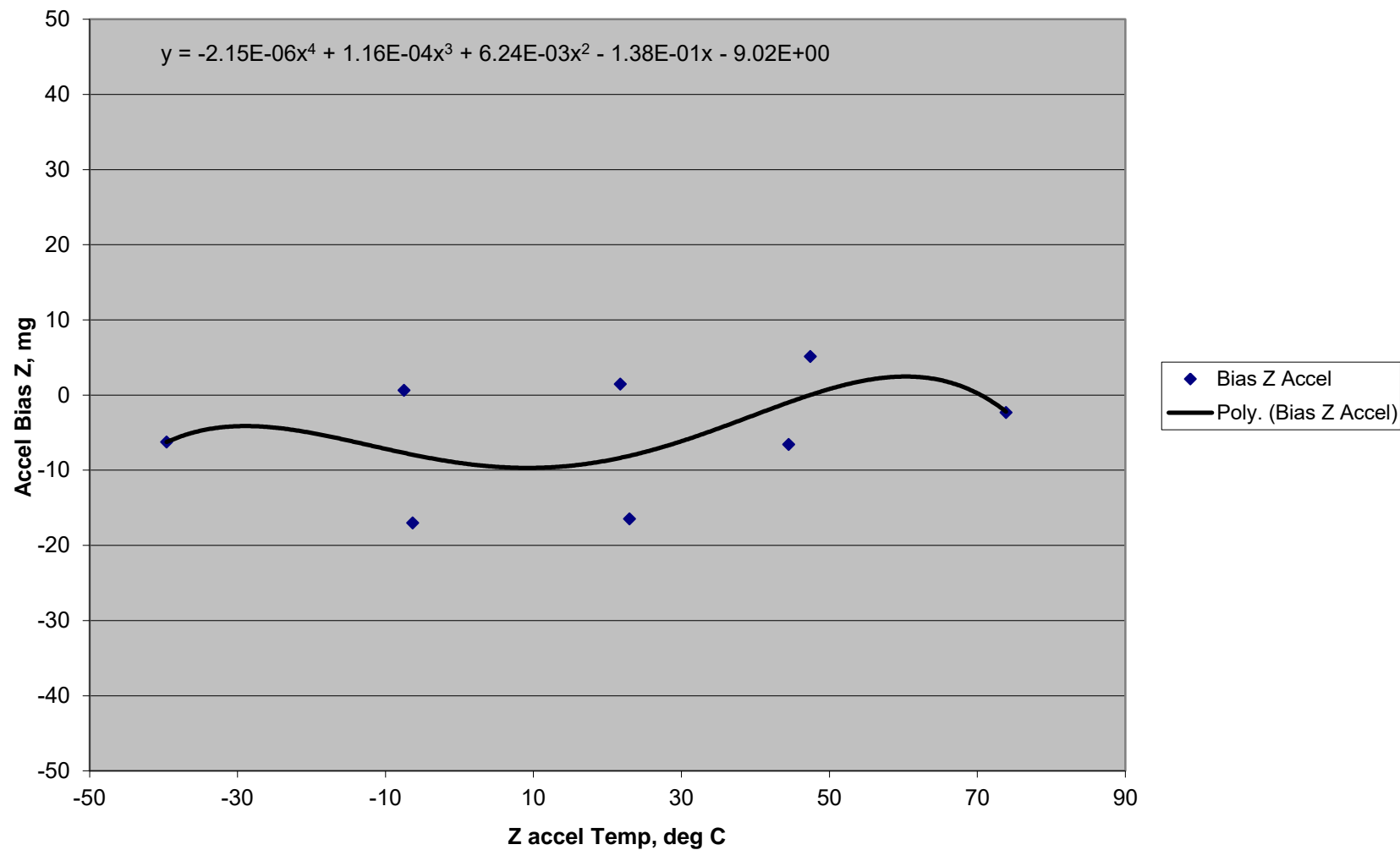
Accel Bias X



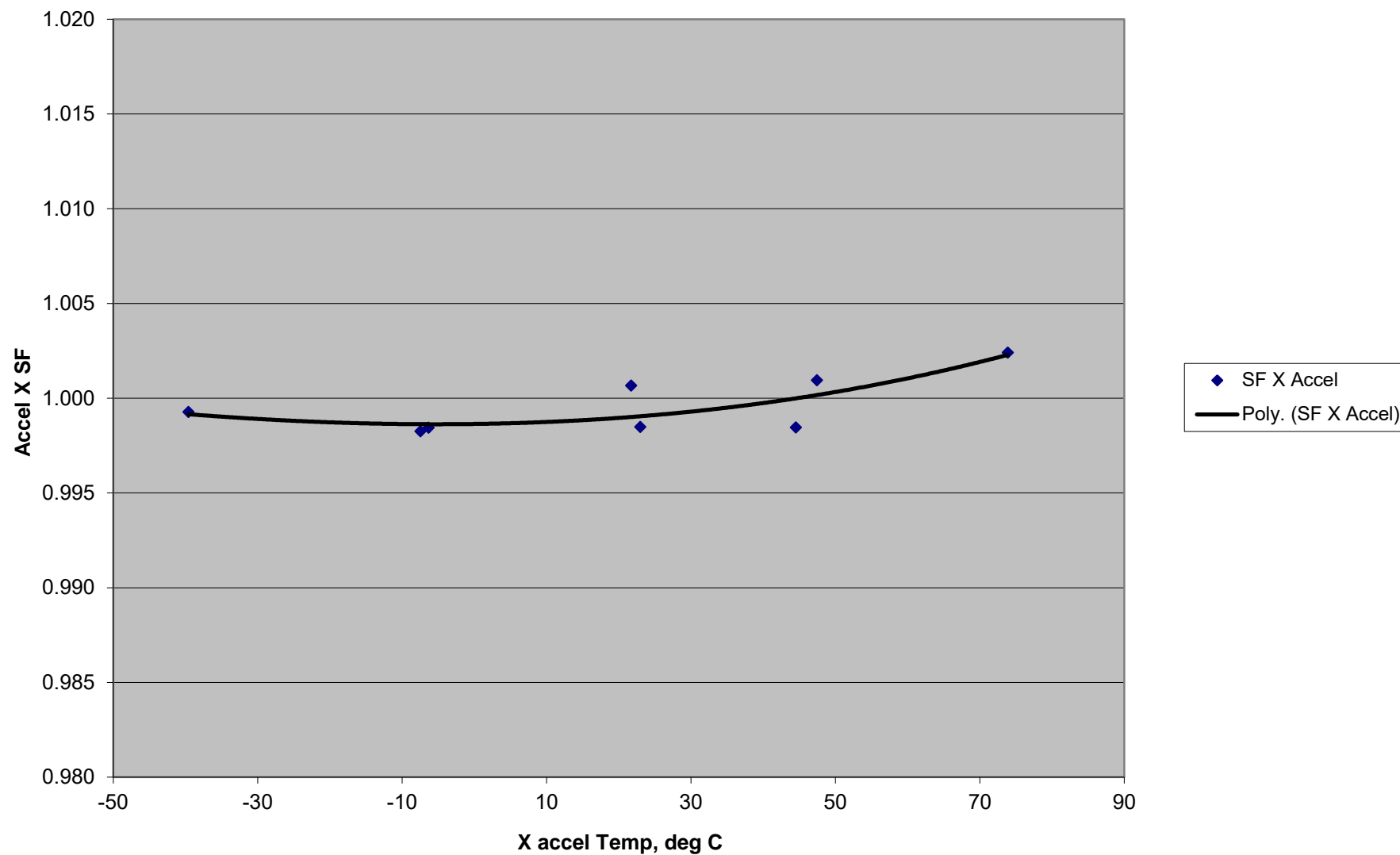
Accel Bias Y



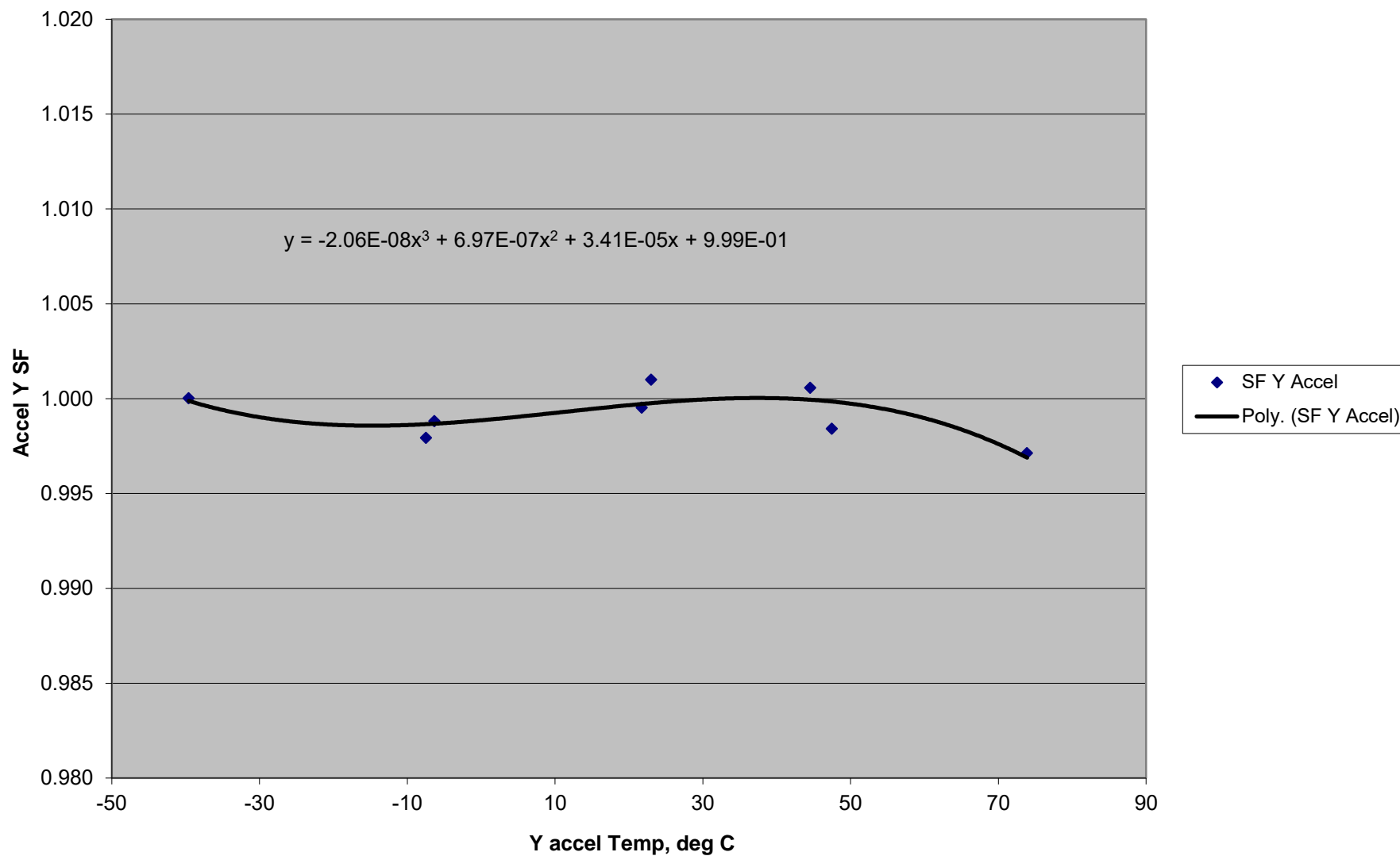
Accel Bias Z



Accel SF X
 $y = 1.17E-09x^3 + 5.10E-07x^2 + 5.35E-06x + 9.99E-01$



Accel SF Y



Accel SF Z

