Optima Certificate of Calibration

Date	Serial Number
16 Apr 2020	11302M
Model Number	**Calibration Number**
BMS400600-2K	11302M-2
Capacity	**Calibration Technician**
9000 N (2000 lbs)	P Aragon

Applicable Standards

AAMI/ES 60601-1, Issued 2005/01/01: Medical electrical equipment Part 1 - Safety requirements for Electrical Equipment for basic safety and essential performance.

CAN/CSA C22.2 #60601-1, Issued 2008/02/01 Ed. 3: Medical electrical equipment Part 1 - Safety requirements for Electrical Equipment for basic safety and essential performance.

IEC 60601-1, Issued 2005/01/01 Ed. 3: Medical electrical equipment Part 1 - Safety requirements for Electrical Equipment for basic safety and essential performance.

IEC 60601-1-6, Issued 2006/12/08 Ed. 2: Medical electrical equipment Part 1-6 - General Requirements for Safety - collateral Standard: Usability.

NIST Traceability

Ref Amp: Optima (4640) Last Calibrated on 01 Apr 2020

DUT Amp: Gen5 (3613) Last Calibrated on 01 Apr 2020

Load Cell: Load CellZ (663988) Last Calibrated on 18 Sep 2019

Load Cell: Load CellXY (400353) Last Calibrated on 18 Sep 2019

This calibration was performed in accordance with AMTI's ISO 9001-approved quality management system. AMTI certifies that force measurements used in this calibration are traceable to primary standards at the United States National Institute of Standards and Technology.

Certified by _____

Calibration Engineer

helpdesk@amtimail.com

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Environmental Information

Temperature: 23 degrees C
Humidity: 24%

Channel Crosstalk

This forceplate has been calibrated and found to provide force and moment outputs accurate to better than ± 0.25% of applied load. Crosstalk effects are included in this accuracy specification. This forceplate must be used in conjunction with an Optima signal conditioner to yield this accuracy level. Slight differences in outputs may be encountered in field installations due to mounting and environmental variations. The following cross talk matrix has been generated from the calibration data and represents the influence of the several isolated input loads on each of the output channels. The main diagonal terms represent the principal sensitivities of a channel's calibrated outputs normalized to calibrated input load. Perfect performance on the main diagonal is indicated by a value of 1.0. Off-diagonal terms represent the sensitivity of a given channel to off-axis load conditions (called crosstalk). Force to force crosstalk terms are expressed as a ratio of applied off-axis load. Moment to force and force to moment cross talk terms are expressed as the ratio of the applied load (force or moment) to the measured output (force or moment) in English calibration units, or pounds and inch-pounds. The headings across the top of the columns correspond to the input loading conditions while the headings down the rows correspond to output channels.

	Fx	Fy	Fz	Mx	My	Mz
Fx'	1.00034	-0.00003	-0.00018	0.00000	0.00000	0.00000
Fy'	-0.00021	0.99968	0.00101	0.00000	0.00000	0.00000
Fz'	-0.00004	0.00013	1.00059	0.00000	0.00000	0.00000
Mx'	0.00000	-0.00002	0.00000	0.99979	-0.00027	-0.00011
My'	-0.00001	0.00002	-0.00004	0.00035	1.00026	0.00008
Mz'	-0.00002	0.00000	-0.00001	-0.00001	0.00007	1.00122

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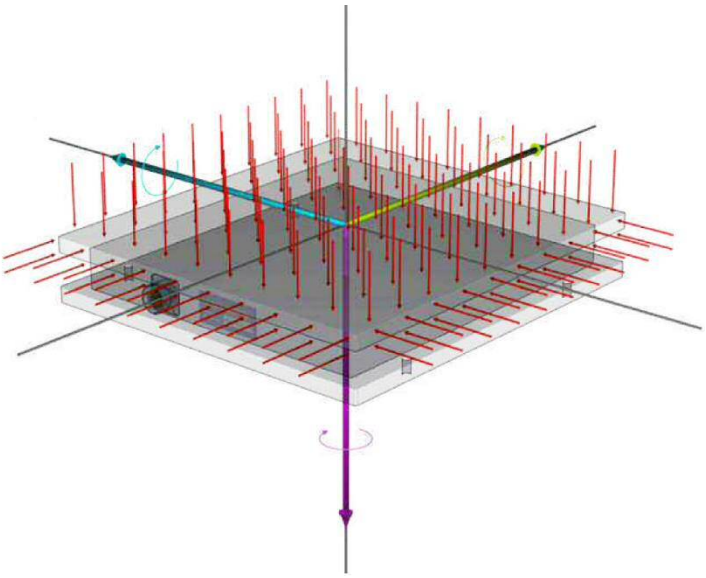
Optima Precision Calibration Overview

Congratulations on your purchase of an AMTI optimized platform. Your new platform calibration has been optimized through an exacting process involving up to 4000 measurements taken over the entire working surface.

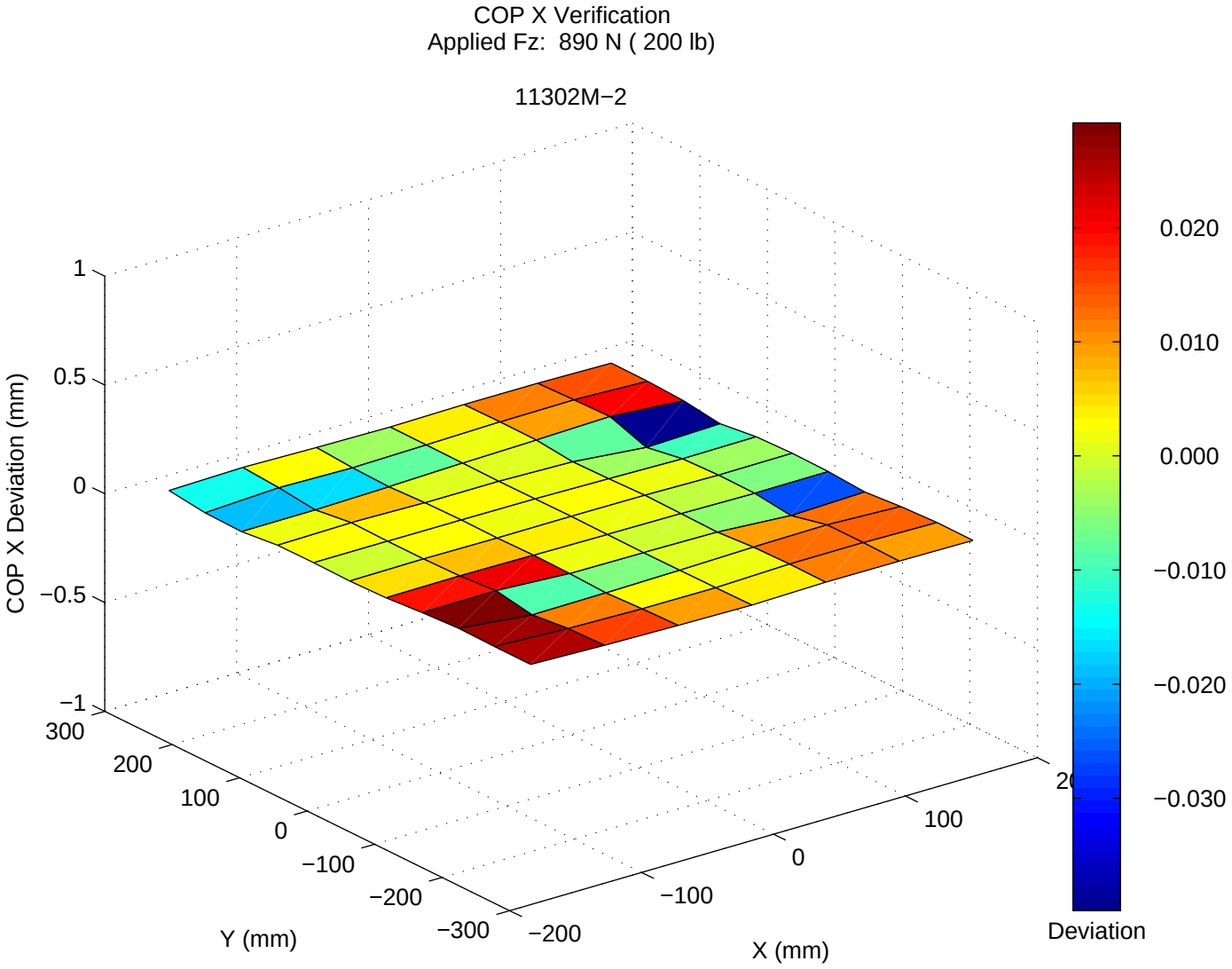


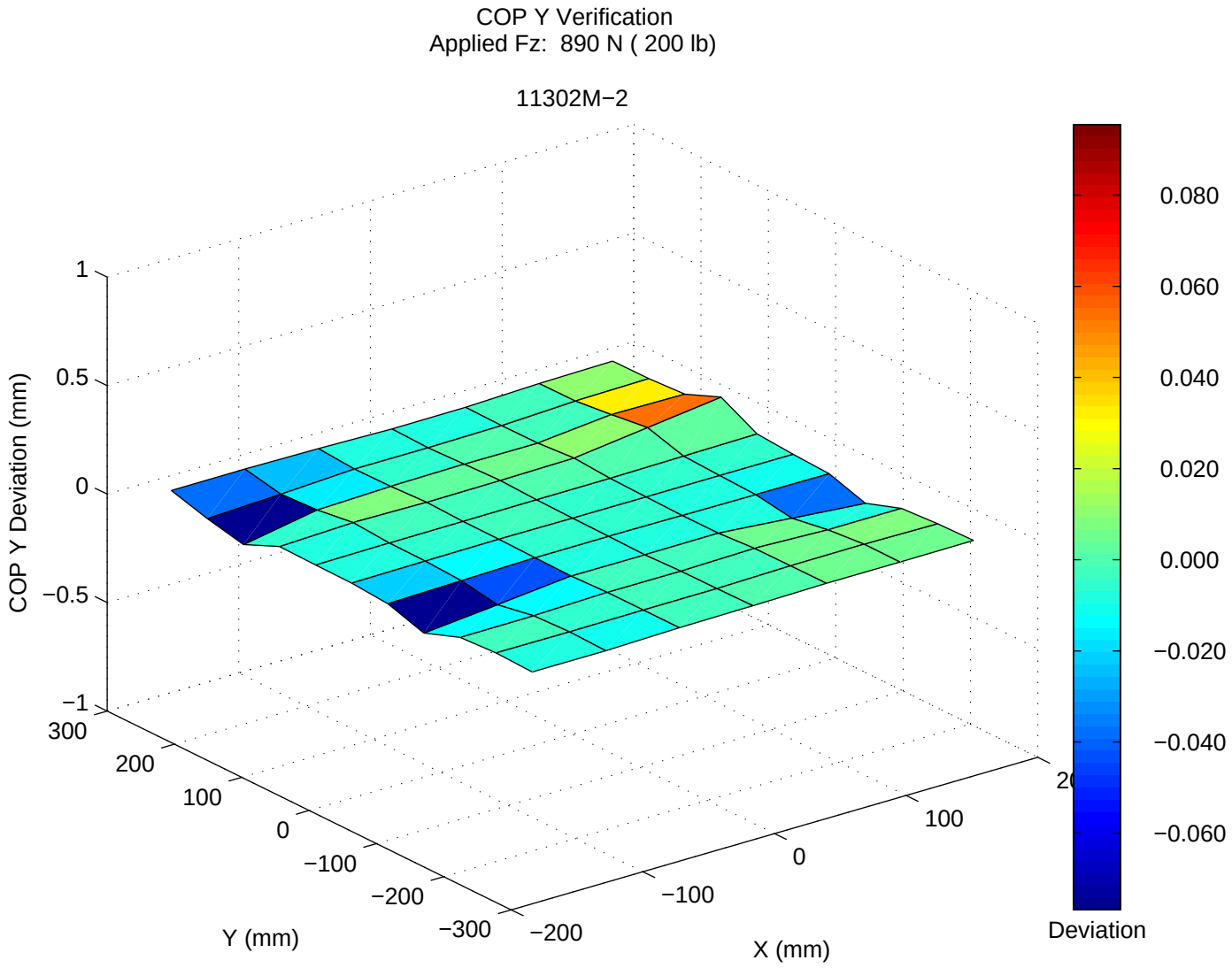
Multiple loads are applied at up to 400 locations using a precision machine capable of maintaining absolute positioning accuracy of 0.005 mm [certified by The Association For Manufacturing Technology].

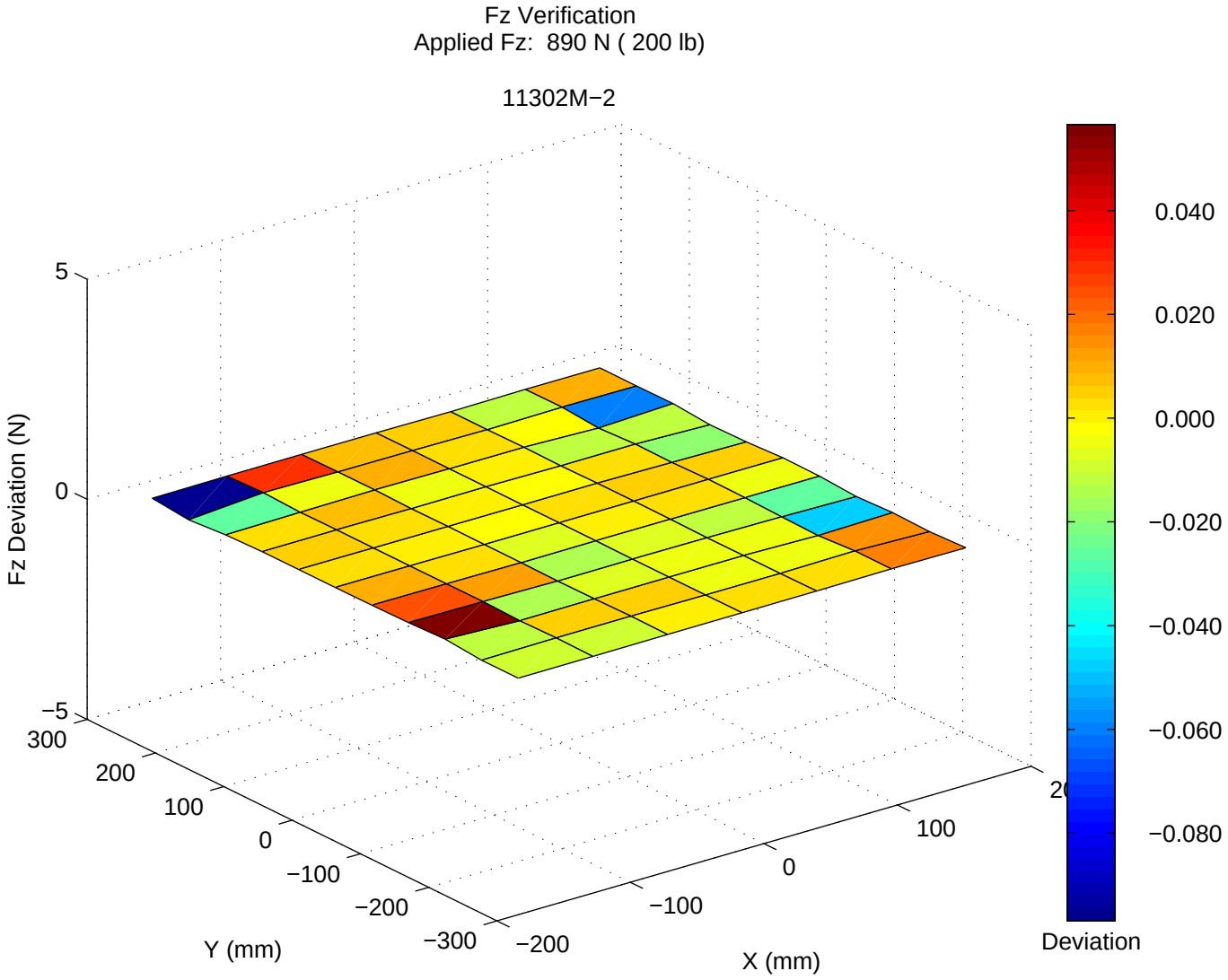
- Live loads from 222 N (50 lb.) to Full Scale Capacity (FSC) are applied across the top and sides of the force plate.
- Dead weights of 222 N, 445 N, and 890 N (50, 100, and 200 lb.) – accurate to 0.01% – are used to verify the system's performance in the physiological testing range.
- Secondary characteristics, such as linearity and hysteresis are measured at eight locations using a ten-point-up, ten-point-down calibration protocol.

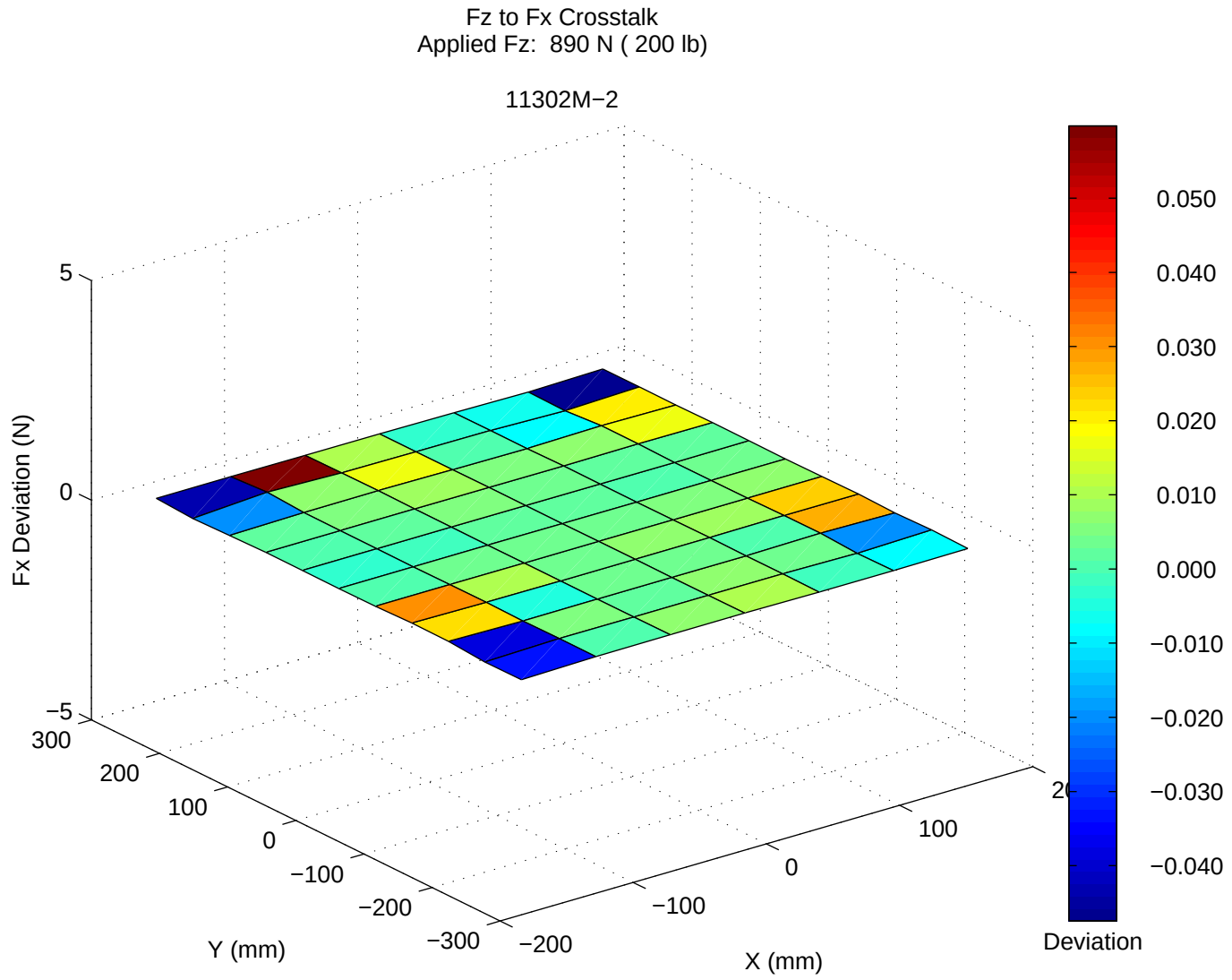
This exhaustive calibration and verification process ensures that each system offers exceptional quality, accuracy, and performance.

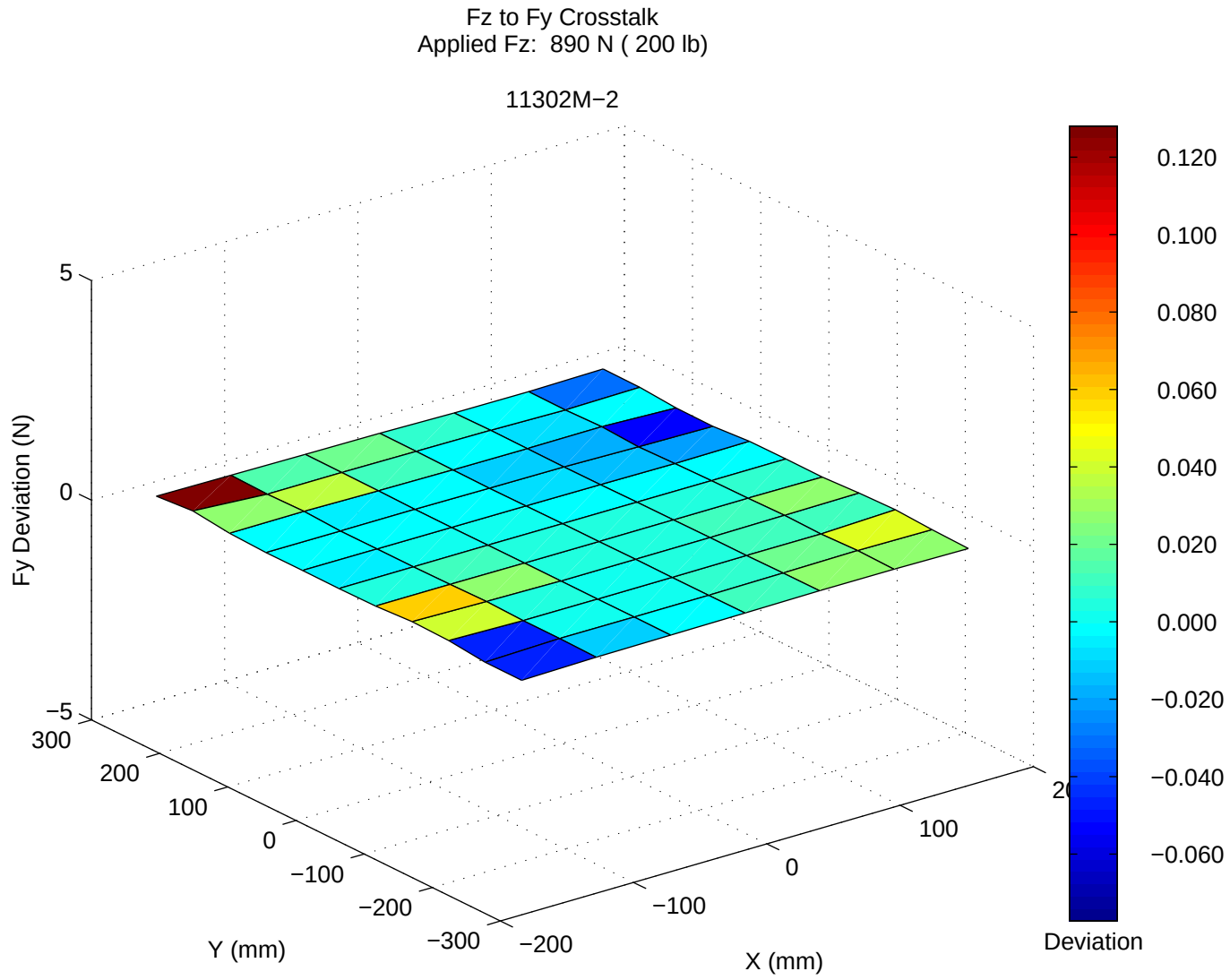
You will find five plots on the following pages that characterize the accuracy of your optimized platform at 890 N (200 lb.) applied Fz load. Each intersection of the grids represents a physical location at which performance verification data was taken. Any measurement deviation is reflected by the contours of the plots that extend above and below the zero plane.


COP X Verification
Applied Fz: 890 N (200 lb)
11302M−2
COP X Deviation (mm)
1
0.5
0
−0.5
−1
300
200
100
0
−100
−200
−300
Y (mm)
−200
−100
0
100
X (mm)
0.020
0.010
0.000
−0.010
−0.020
−0.030
Deviation


COP Y Verification
Applied Fz: 890 N (200 lb)
11302M−2
COP Y Deviation (mm)
1
0.5
0
−0.5
−1
300
200
100
0
−100
−200
−300
Y (mm)
−200
−100
0
100
X (mm)
0.080
0.060
0.040
0.020
0.000
−0.020
−0.040
−0.060
Deviation


Fz Verification
Applied Fz: 890 N (200 lb)
11302M−2
Fz Deviation (N)
5
0
−5
300
200
100
0
−100
−200
−300
Y (mm)
−200
−100
0
100
X (mm)
0.040
0.020
0.000
−0.020
−0.040
−0.060
−0.080
Deviation


Fz to Fx Crosstalk
Applied Fz: 890 N (200 lb)
11302M−2
Fx Deviation (N)
5
0
−5
300
200
100
0
−100
−200
−300
Y (mm)
−200
−100
0
100
X (mm)
0.050
0.040
0.030
0.020
0.010
0.000
−0.010
−0.020
−0.030
−0.040
Deviation


Fz to Fy Crosstalk
Applied Fz: 890 N (200 lb)
11302M−2
Fy Deviation (N)
5
0
−5
300
200
100
0
−100
−200
−300
Y (mm)
−200
−100
0
100
X (mm)
0.120
0.100
0.080
0.060
0.040
0.020
0.000
−0.020
−0.040
−0.060
Deviation