



300mm SOI Wafer Curvature Test Results

INTRODUCTION

k-Space has performed wafer bow (curvature) reproducibility tests, both static and dynamic, on 300mm SOI silicon wafers per a customer defined test definition. The tests were performed using a proven configuration of our patented Multi-beam Optical Sensor (MOS) and a 300mm x,y translation stage. The 300mm non-adjustable wafer platter was configured with 3-point (non-vacuum) contacts. Note that the 300mm wafer platter is not a current standard for k-Space and as such, there is no tilt or height adjustment capability for leveling the wafer. This is clearly evidenced in the data, but tilt and height adjustment could be added in an upgraded wafer stage. Room temperature was maintained at 23.5°C +/- 1°C at all times during the testing.

The wafers were scanned along a single line parallel to the wafer notch, notch oriented to the left on the x-stage and the scan performed from right to left with the x-stage. The scan recipe and summary of results are listed below.

SCAN RECIPE

Scan Type: Line scan x-direction
 Edge Exclusion: 7.5mm
 Resolution: 5mm (57 points)
 Sampling: 16 measurements per site

SUMMARY OF RESULTS

- Static Reproducibility (30 scans without unload)

	Average Curvature (1/m)	1-Sigma Std. Dev. (30 Repeats)
Slot 1A	-0.00617	5.3e-6
Slot 15B	-0.00889	4.7e-6
Slot 25C	-0.01299	5.5e-6

- Dynamic Reproducibility (10 Scans with manual load/unload)

	Average Curvature (1/m)	1-Sigma Std. Dev. (10 Load/Unload)
Slot 1A	-0.00621	1.4e-5
Slot 15B	-0.00891	3.4e-5
Slot 25C	-0.01302	1.5e-5

- Measurement Throughput

Manual load time:	1min. 30sec.
Line scan with flat reference calibration:	2 min. 20 sec.
Line scan only:	1min. 47 sec.

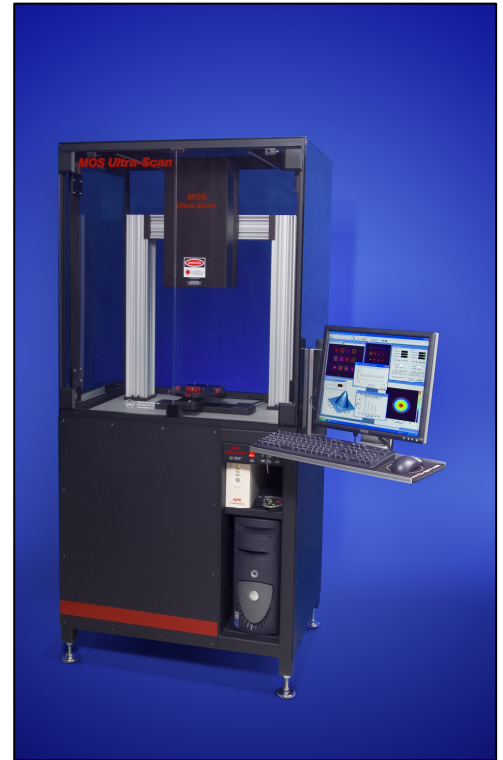


Figure 1: MOS Ultra Scan.



Slot 1A Static Reproducibility

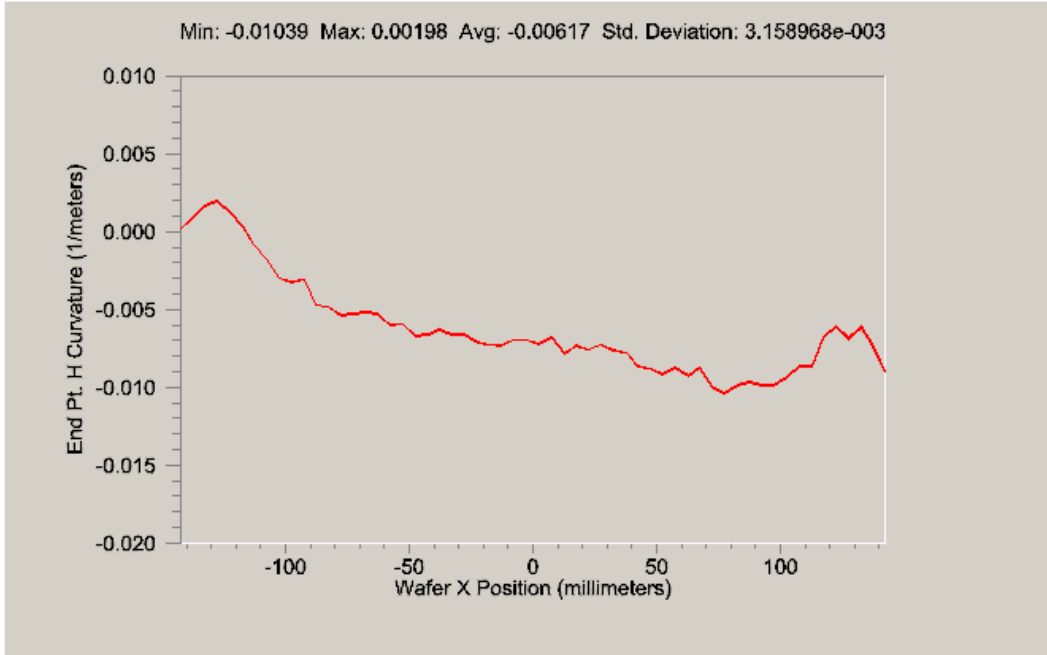


Figure 2: Slot 1A overlay plot of 30 consecutive scans

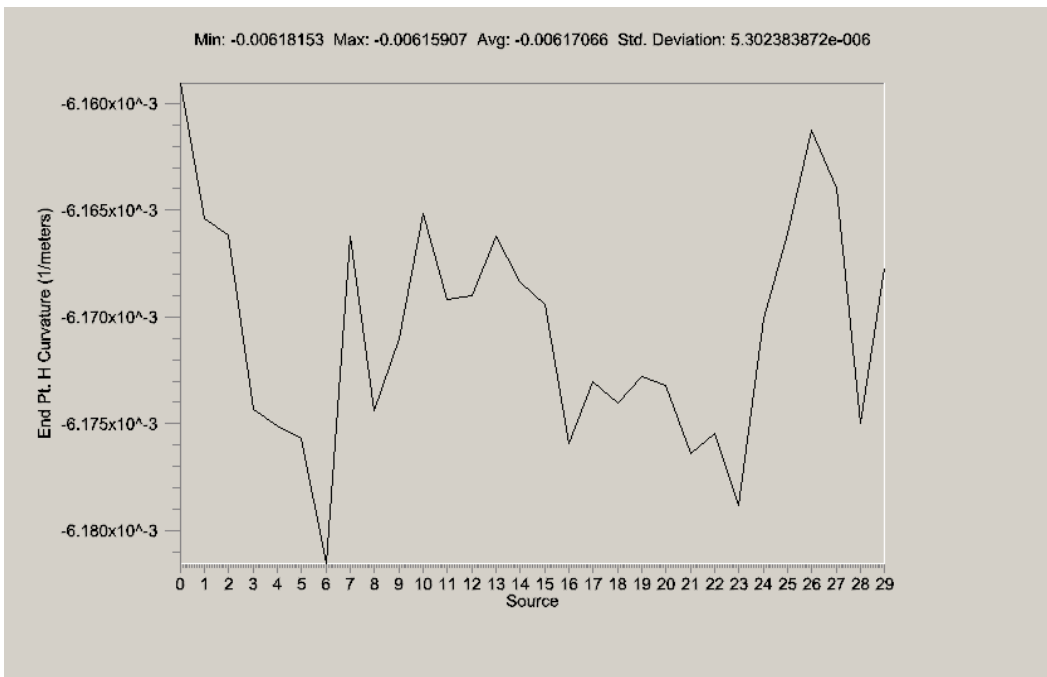


Figure 3: Slot 1A plot of average curvature from each of 30 scans.



Slot 15B Static Reproducibility

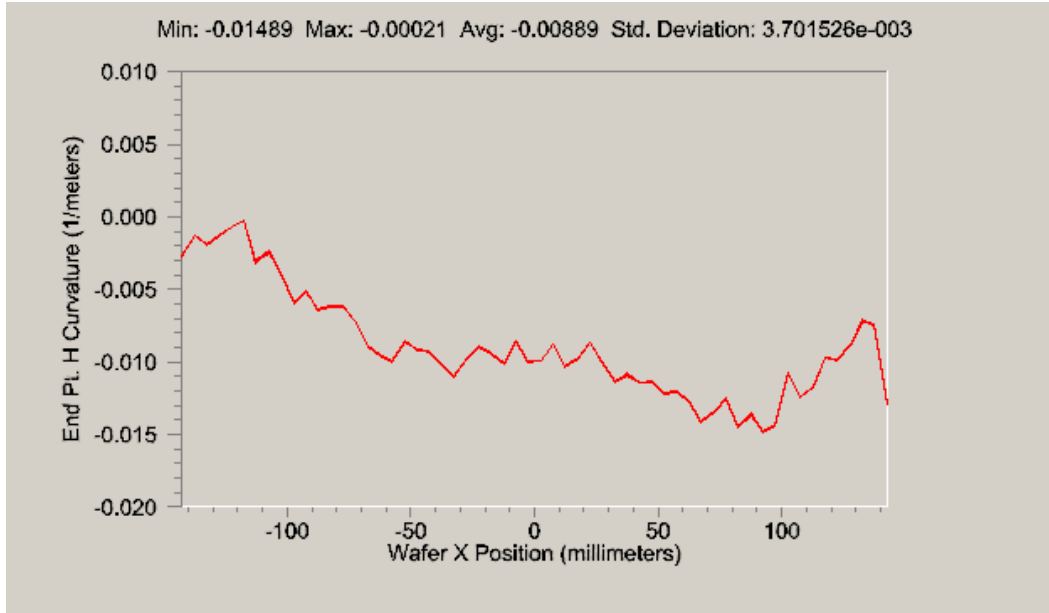


Figure 4: Slot 15B overlay plot of 30 consecutive scans.

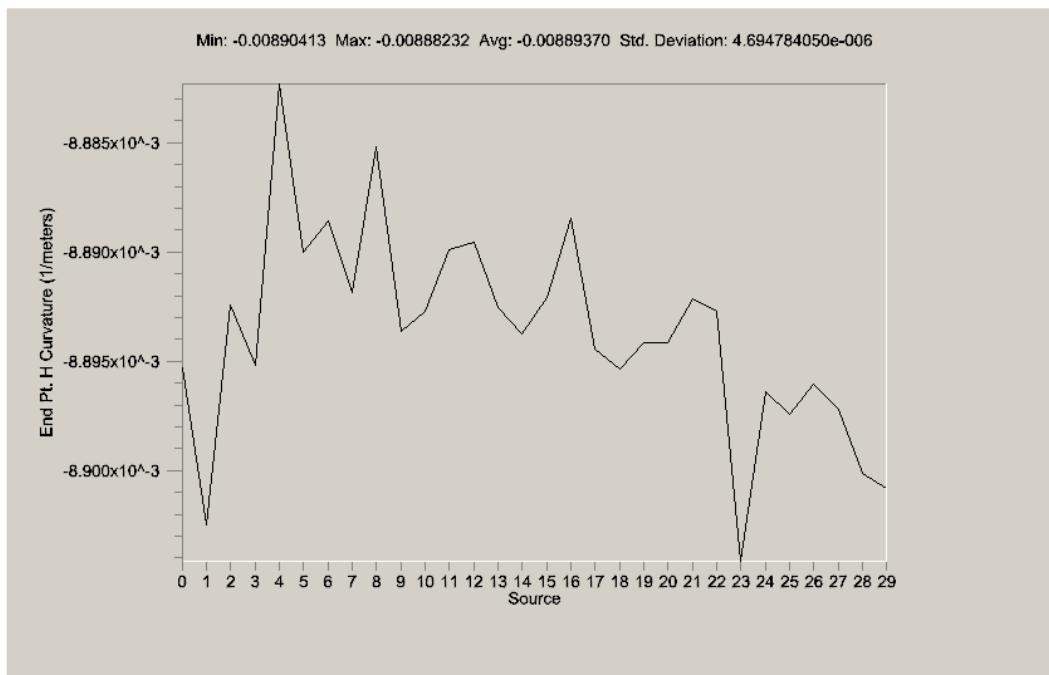


Figure 5: Slot 15B plot of average wafer curvature from each of 30 scans.



Slot 25C Static Reproducibility

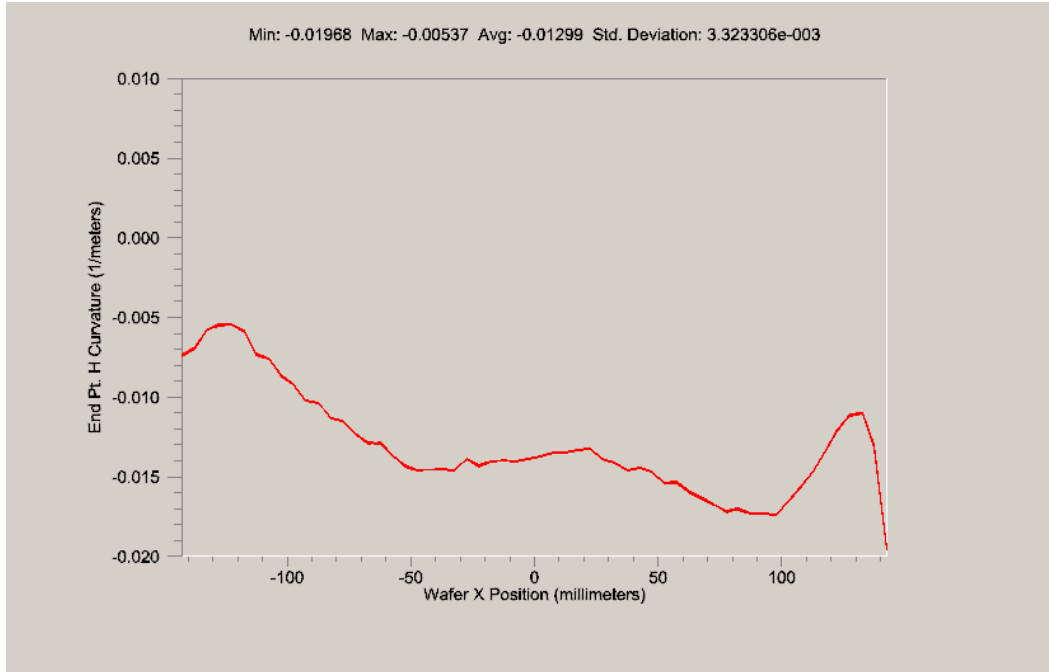


Figure 6: Slot 25C overlay plot of 30 consecutive scans.

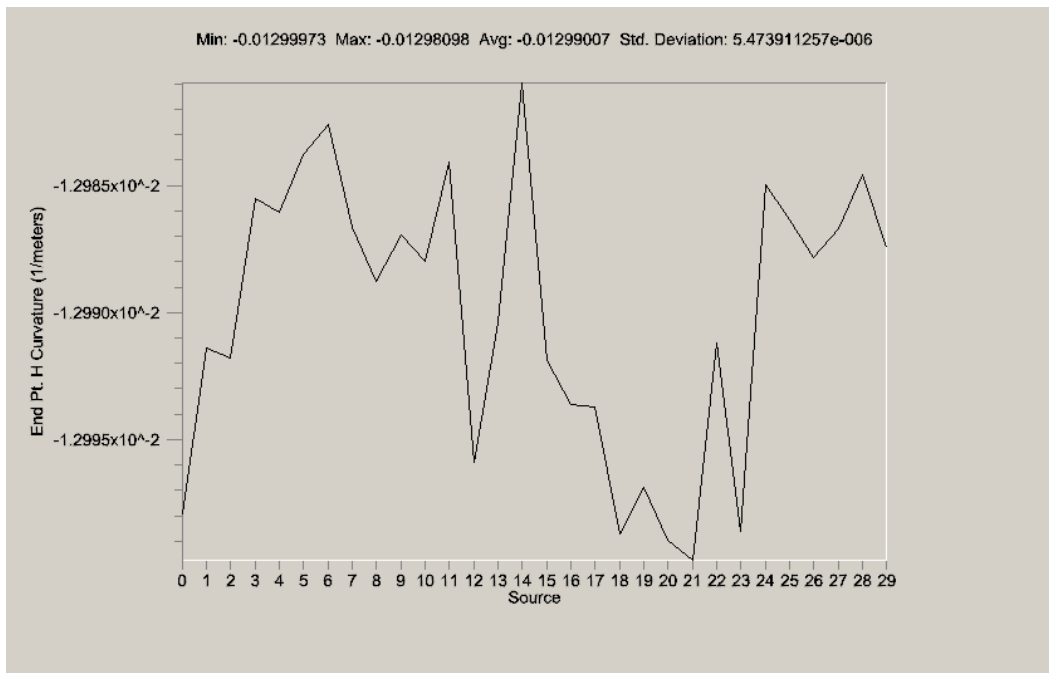


Figure 7: Slot 25C plot of average wafer curvature from each of 30 scans.



Slot 1A Dynamic Reproducibility

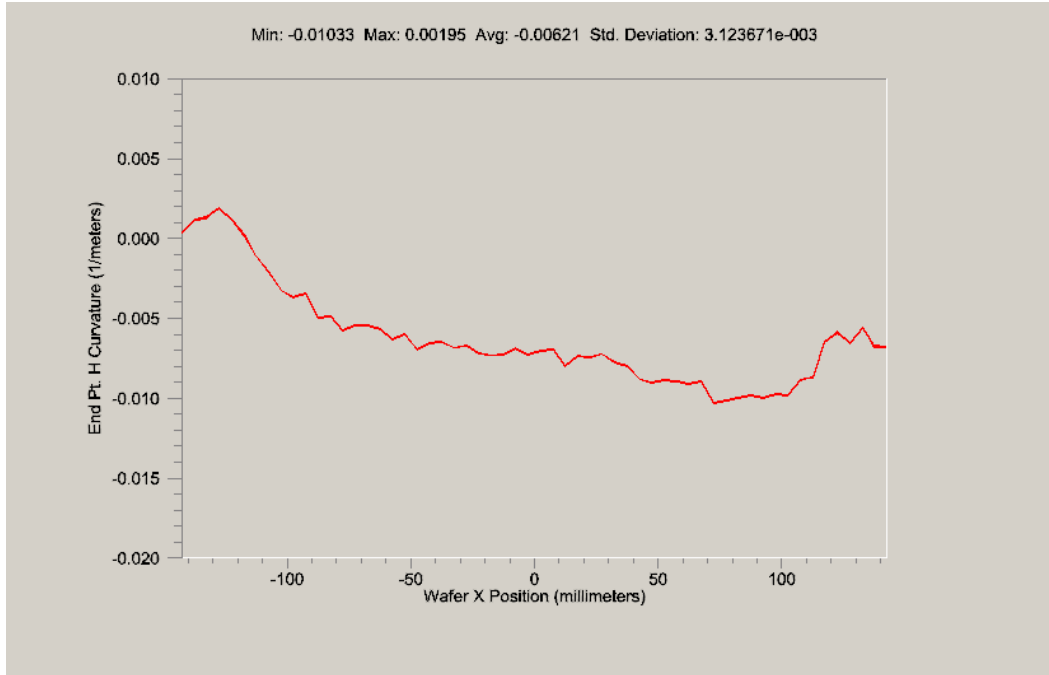


Figure 8: Slot 1A overlay plot of 10 load/unload scans.

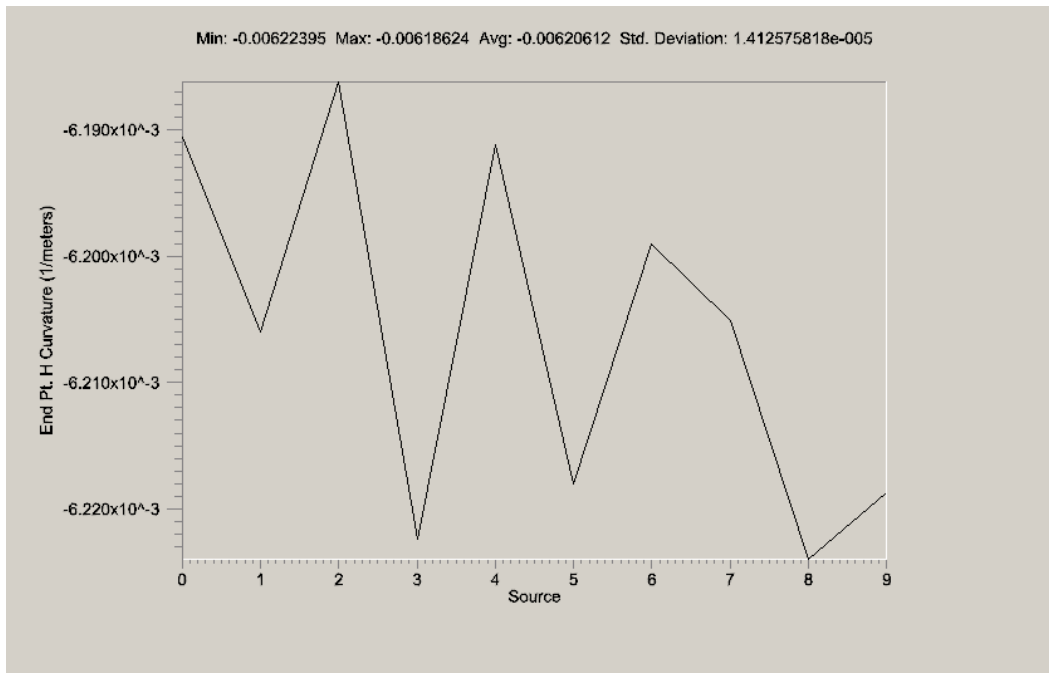


Figure 9: Slot 1A plot of average wafer curvature from each of 10 load/unload scans.



Slot 15B Dynamic Reproducibility

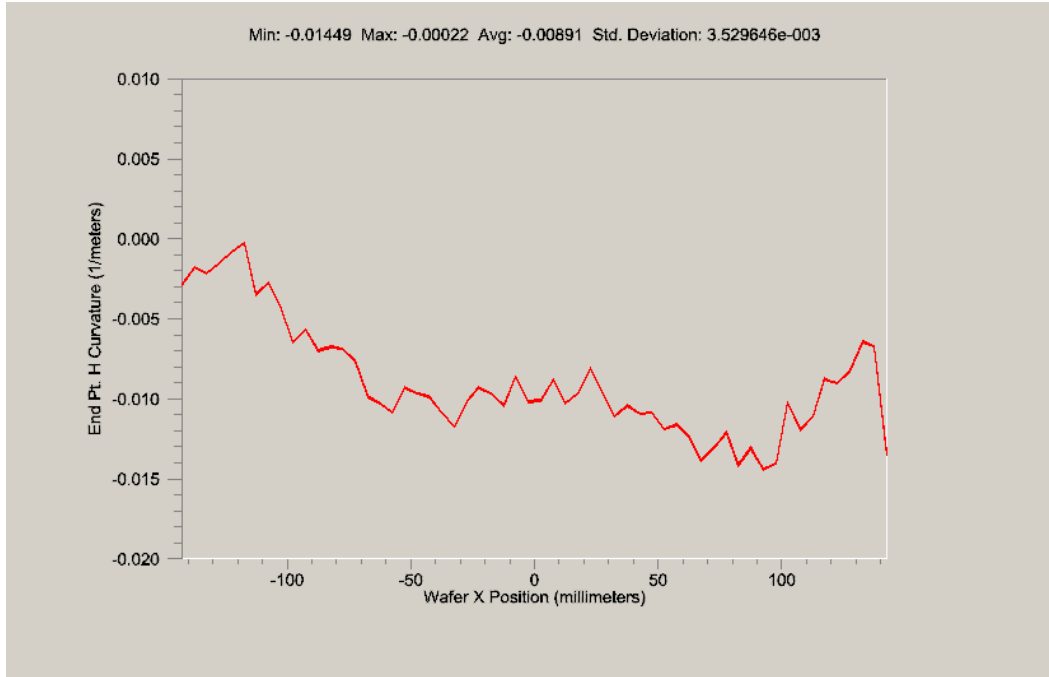


Figure 10: Slot 15B overlay plot of 10 load/unload scans.

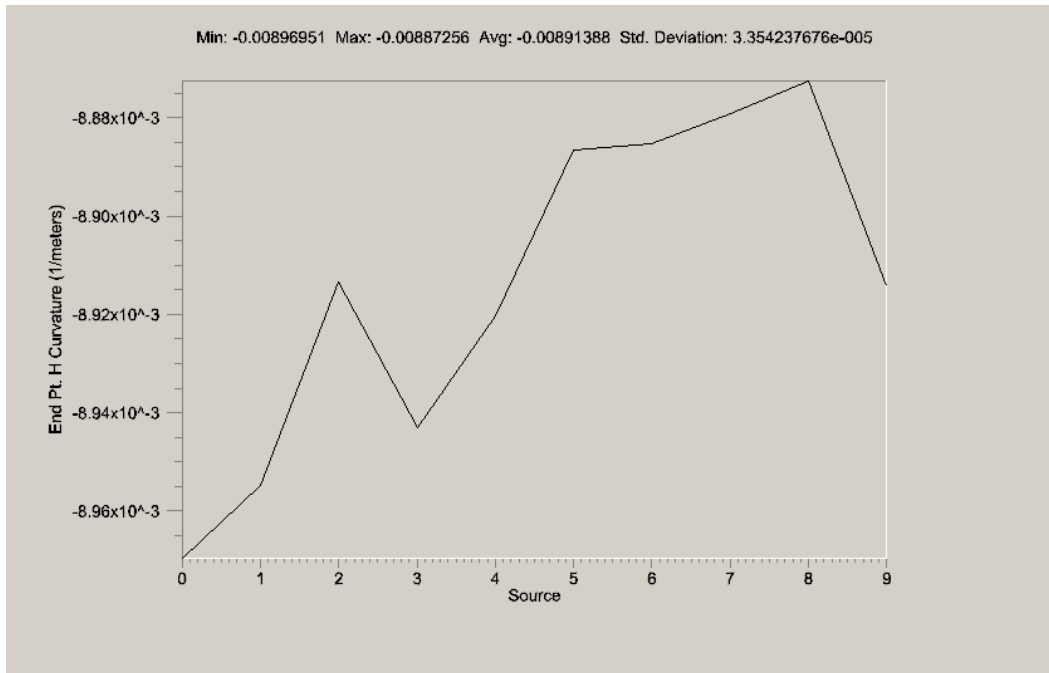


Figure 11: Slot 15B plot of average wafer curvature from each of 10 load/unload scans.



Slot 25C Dynamic Reproducibility

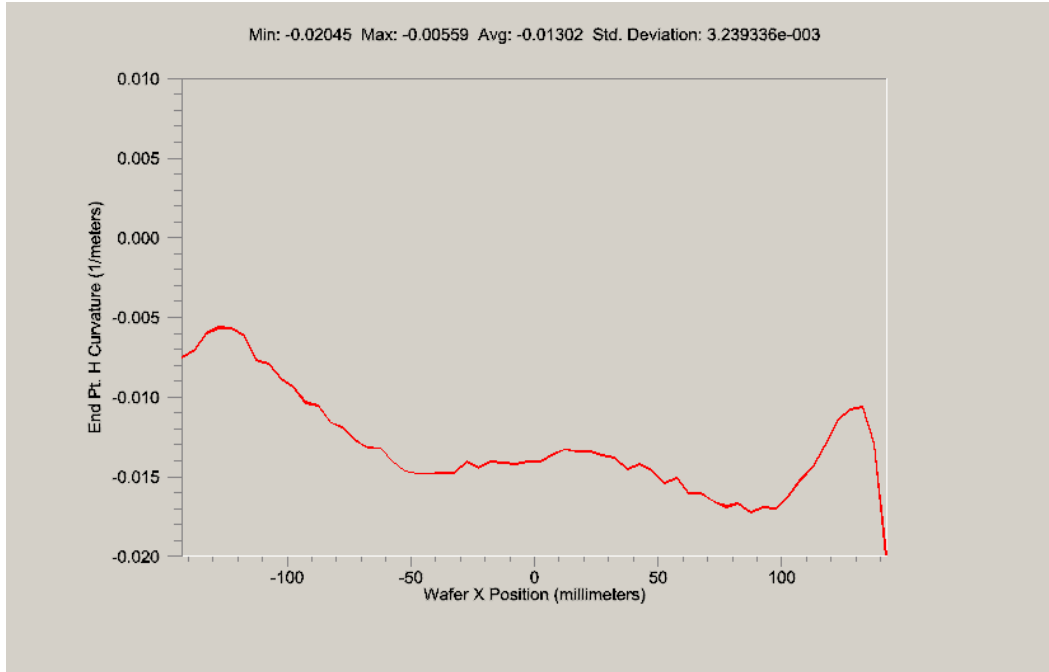


Figure 12: Slot 25C overlay plot of 10 load/unload scans.

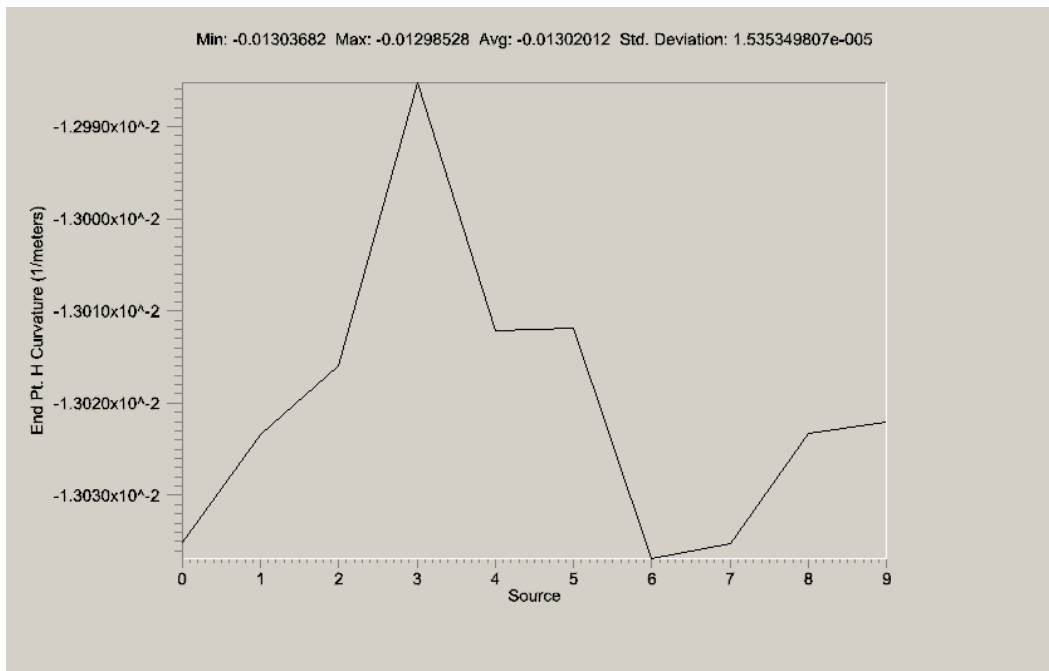


Figure 13: Slot 25C plot of average wafer curvature from each of 10 load/unload scans.