

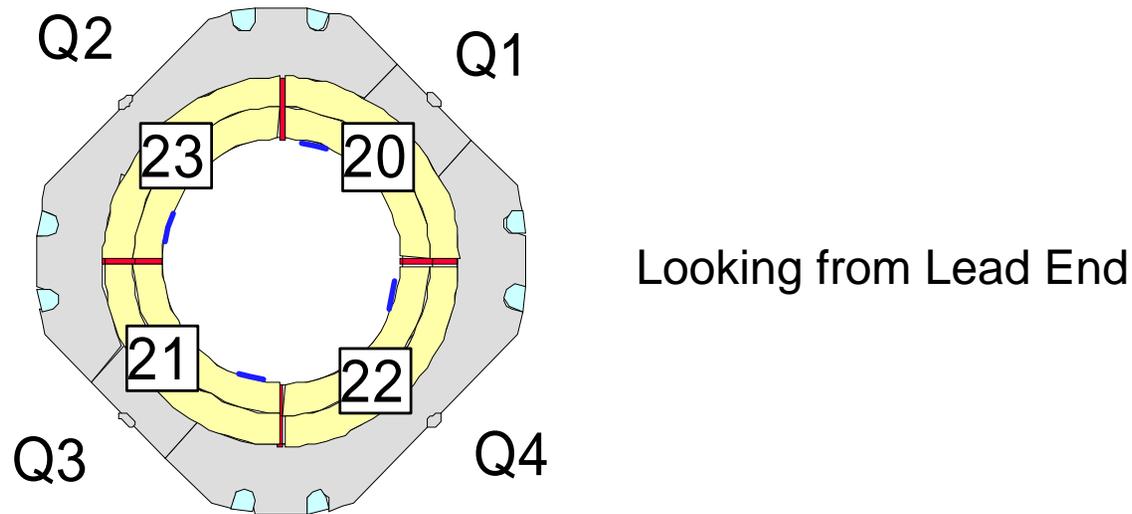
# **TQC02E Coil Measurements in Free State**

**Fermilab Technical Division Technical Memo TD-08-005**

**R. Bossert and R. Riley  
1-3-08**

**Coil sizes measured on CMM by R. Riley before construction of TQC02E**

**TQC02E is made from coils 20, 21, 22 and 23. All coils have been previously used in TQS02. They are arranged in TQC02E as shown below.**

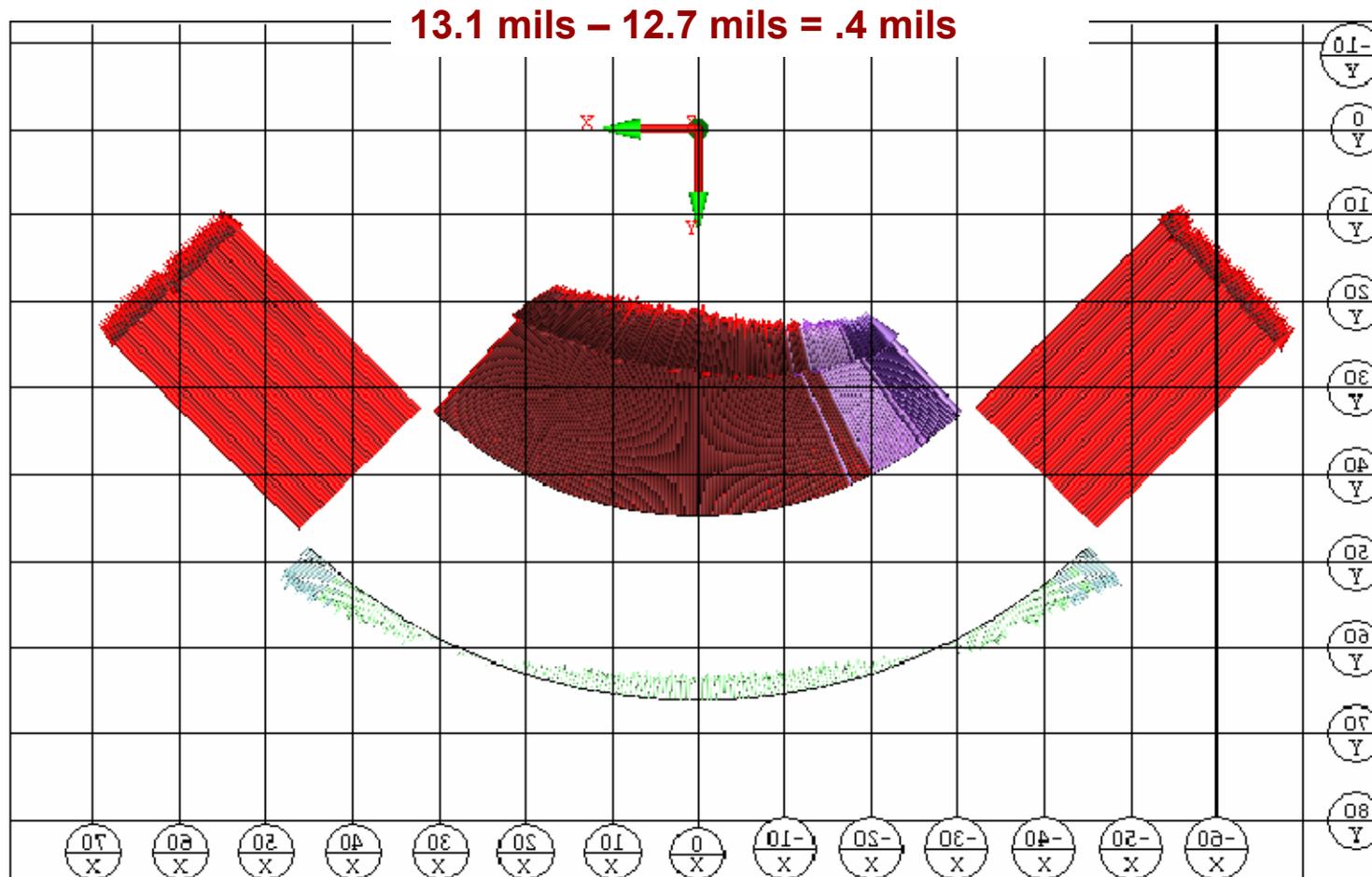


**Size of all coils before installation in TQC02E were determined by Coordinate Machine Measurements, shown in the following slides. The azimuthal measurements of all coils have been adjusted by 12.7 mils because these coils have an extra 10 mils of ground insulation on the outside surface, and 5 mils of ground insulation on the azimuthal surfaces, potted into the coils, which do not appear in the master program.**

**12.7 mils = 5 mils for extra azimuthal insulation + 7 mils ( $10/\sqrt{2}$ ) because coil was moved up with respect to the program's outer diameter by 10 mils + .7 mils ( $1/\sqrt{2}$ ) because coil was moved up an extra mil, as can be seen from the inspection illustrations.**

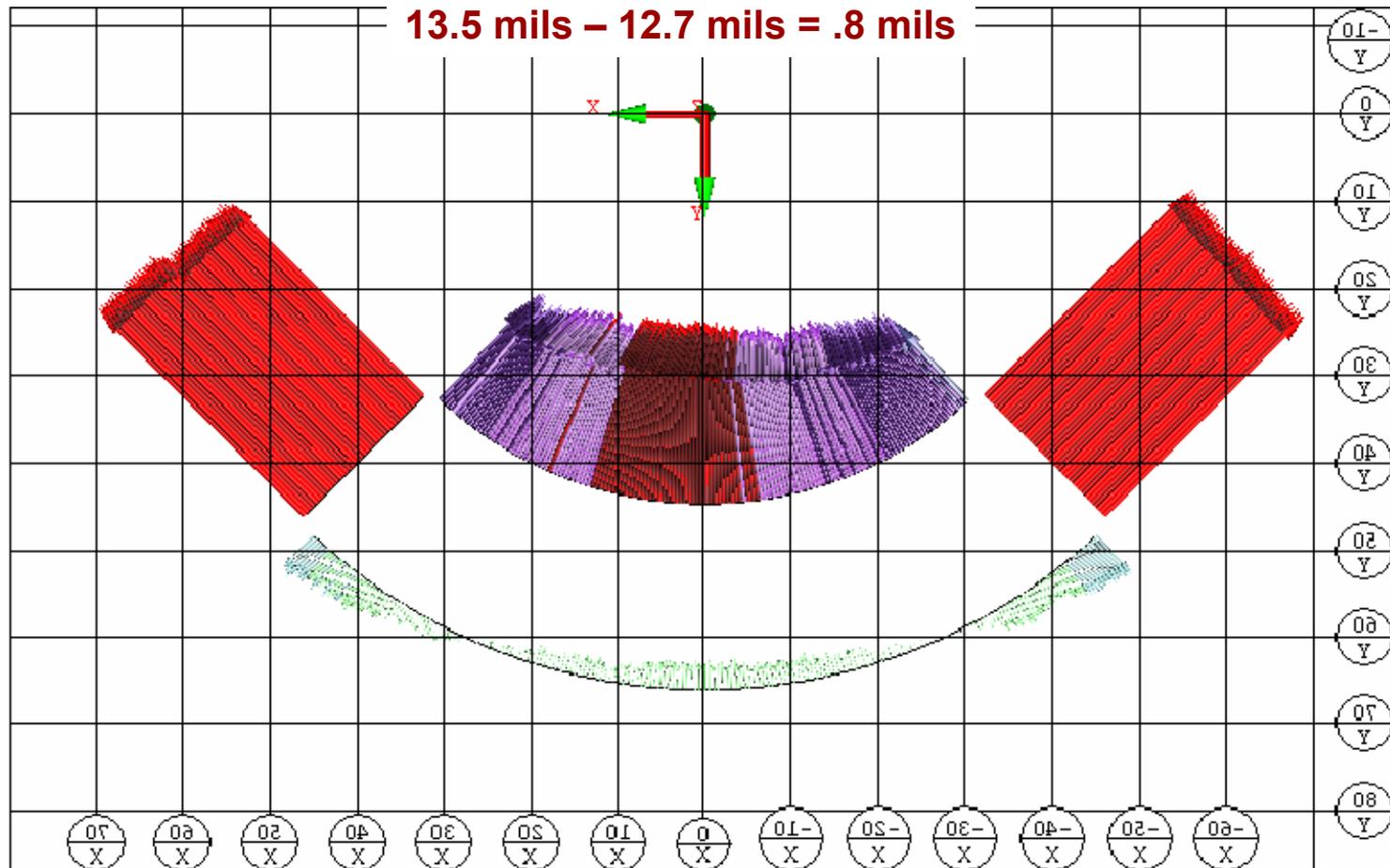
Coil 20 117 mm from lead end looking from lead end

After TQS02a



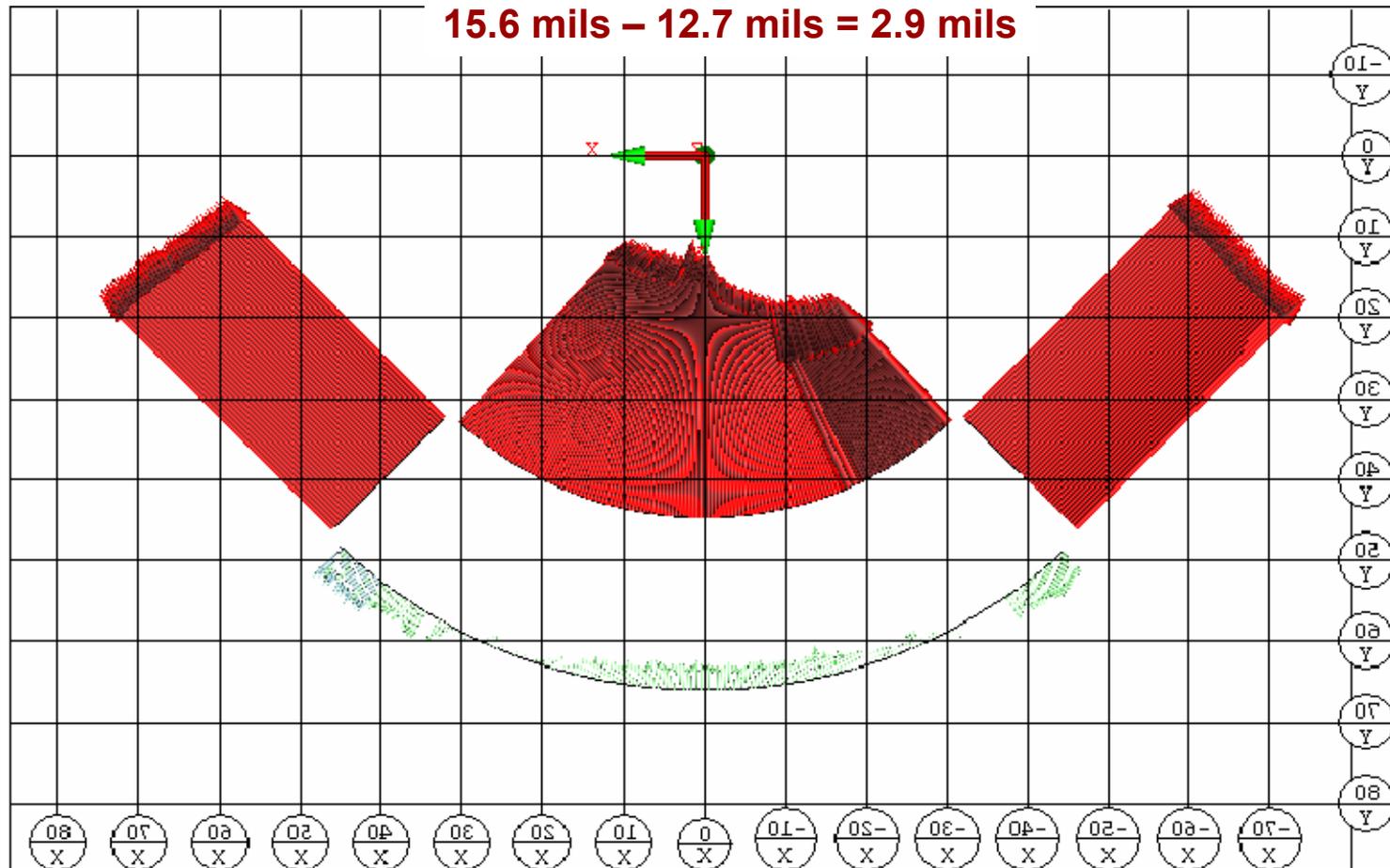
Coil 20 149mm from lead end looking from lead end

After TQS02a



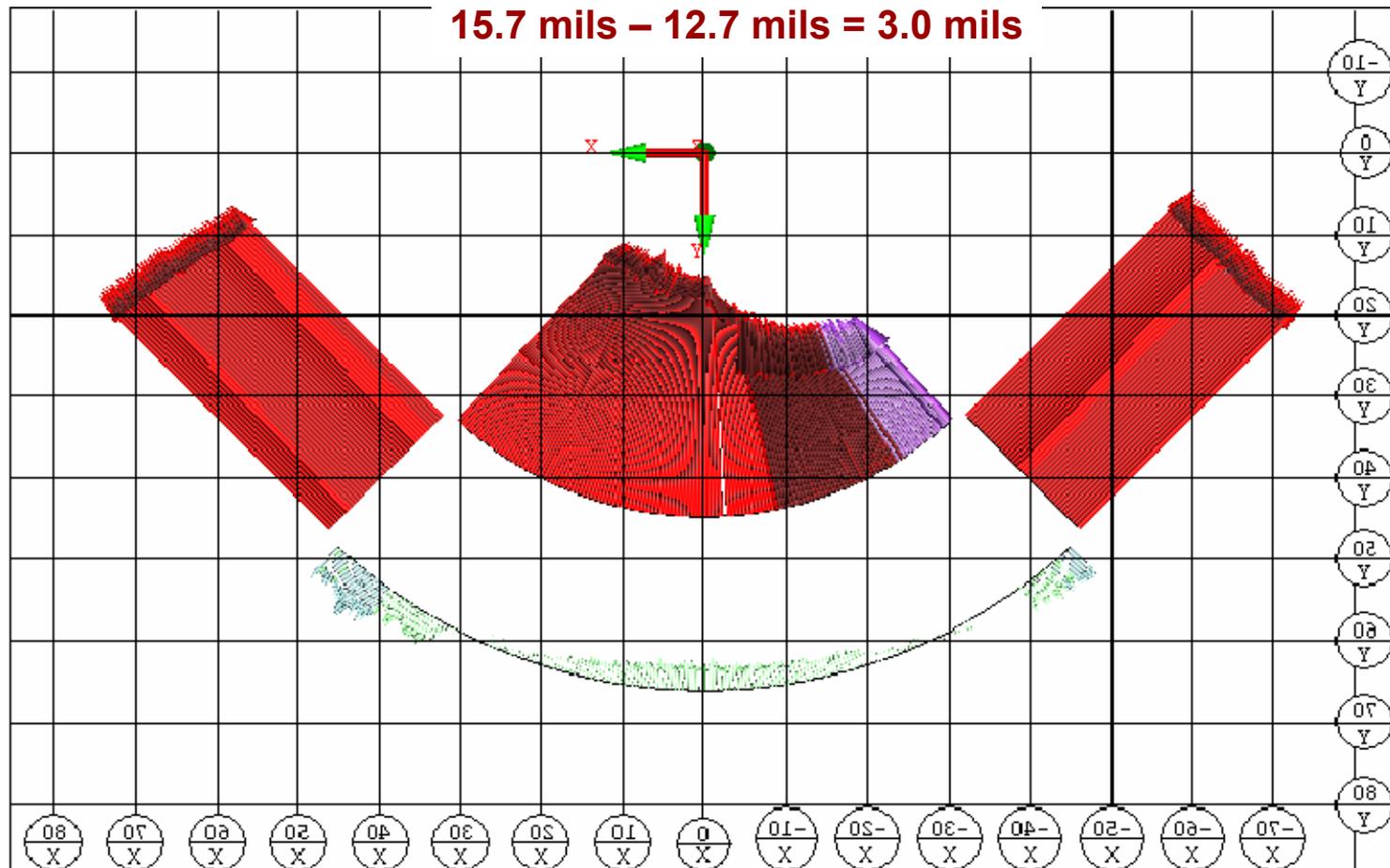
Coil 20 401mm from lead end looking from lead end

After TQS02a



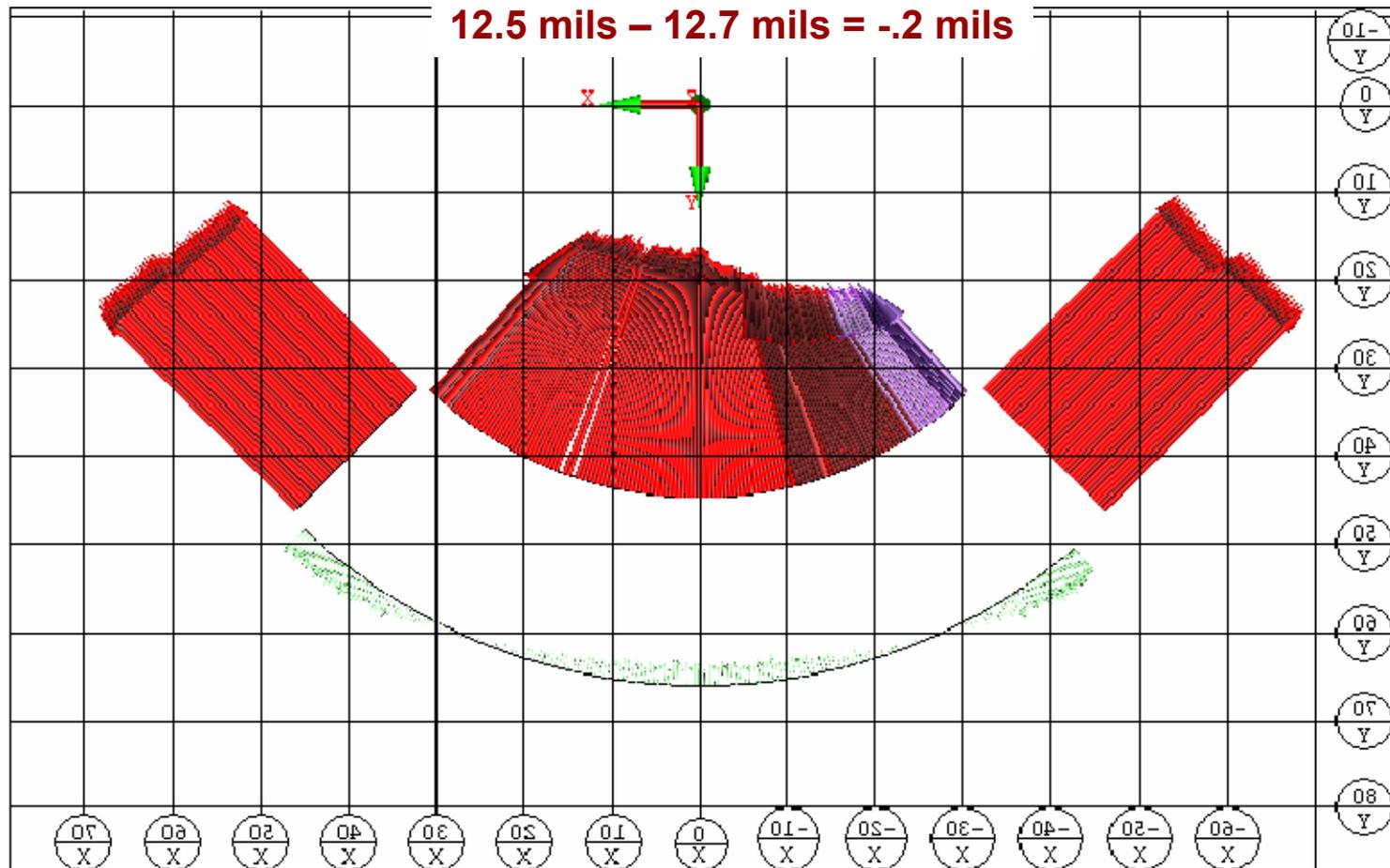
Coil 20 579mm from lead end looking from lead end

After TQS02a



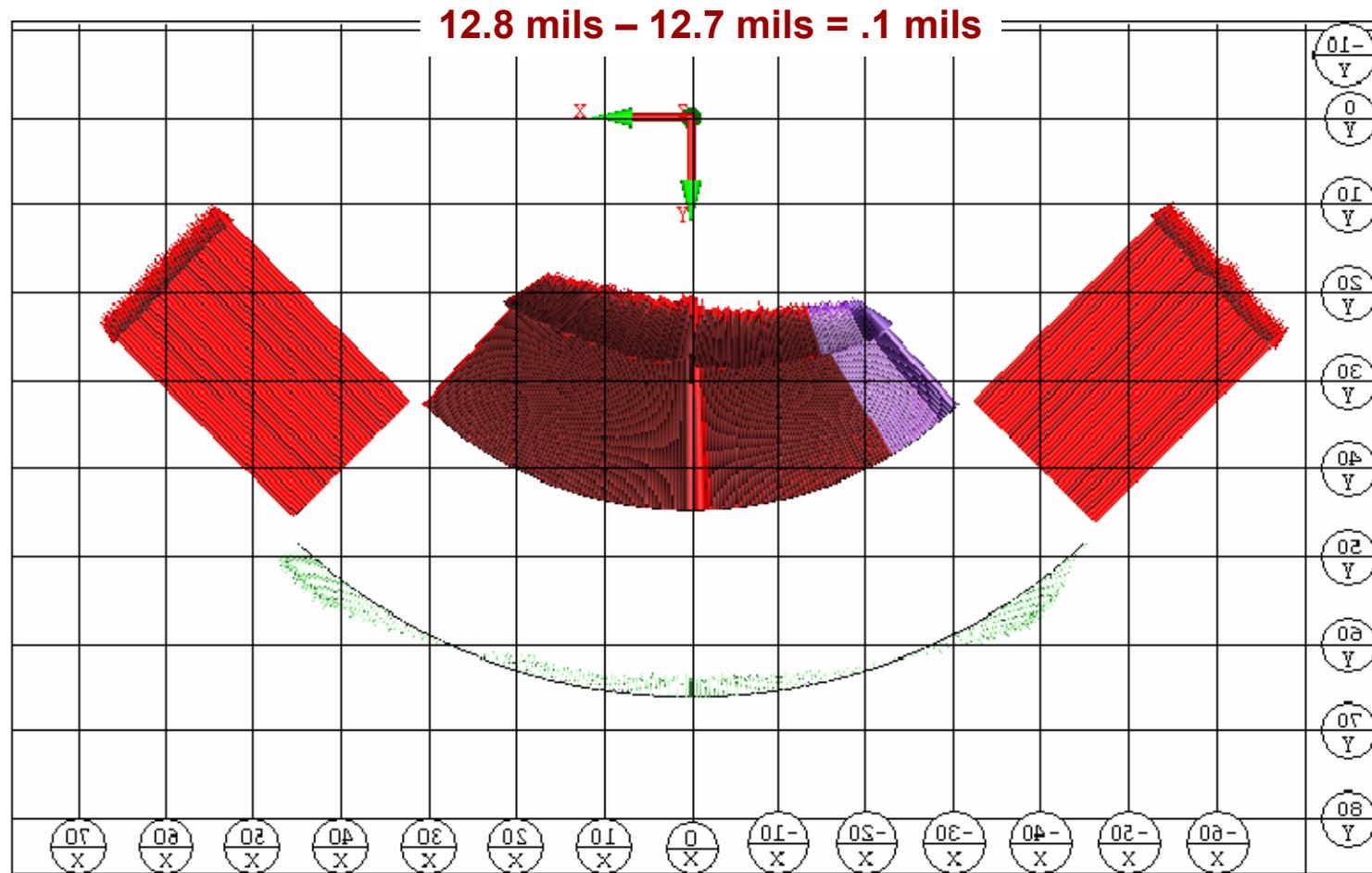
Coil 20 936mm from lead end looking from lead end

After TQS02a



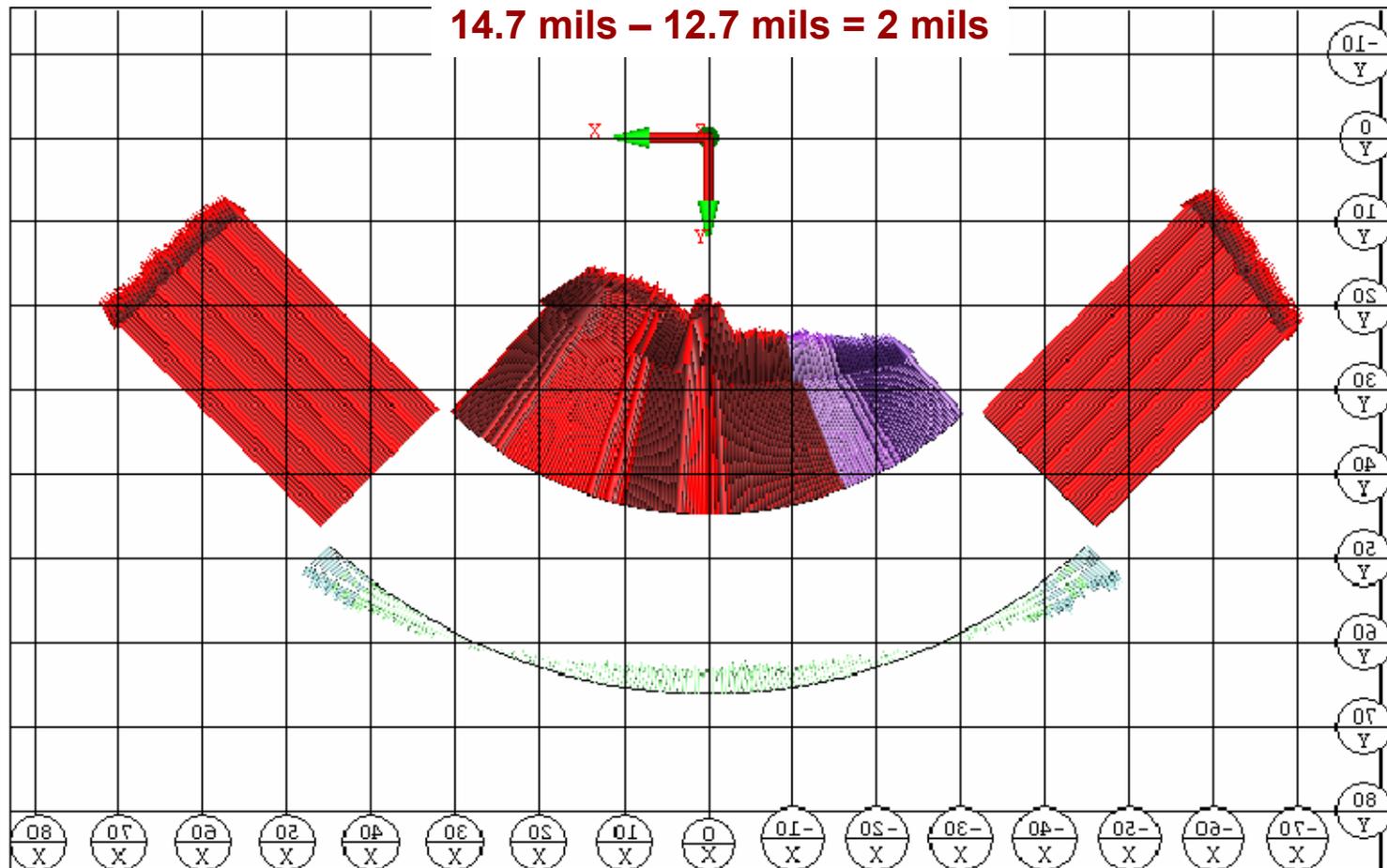
Coil 20 972mm from lead end looking from lead end

After TQS02a



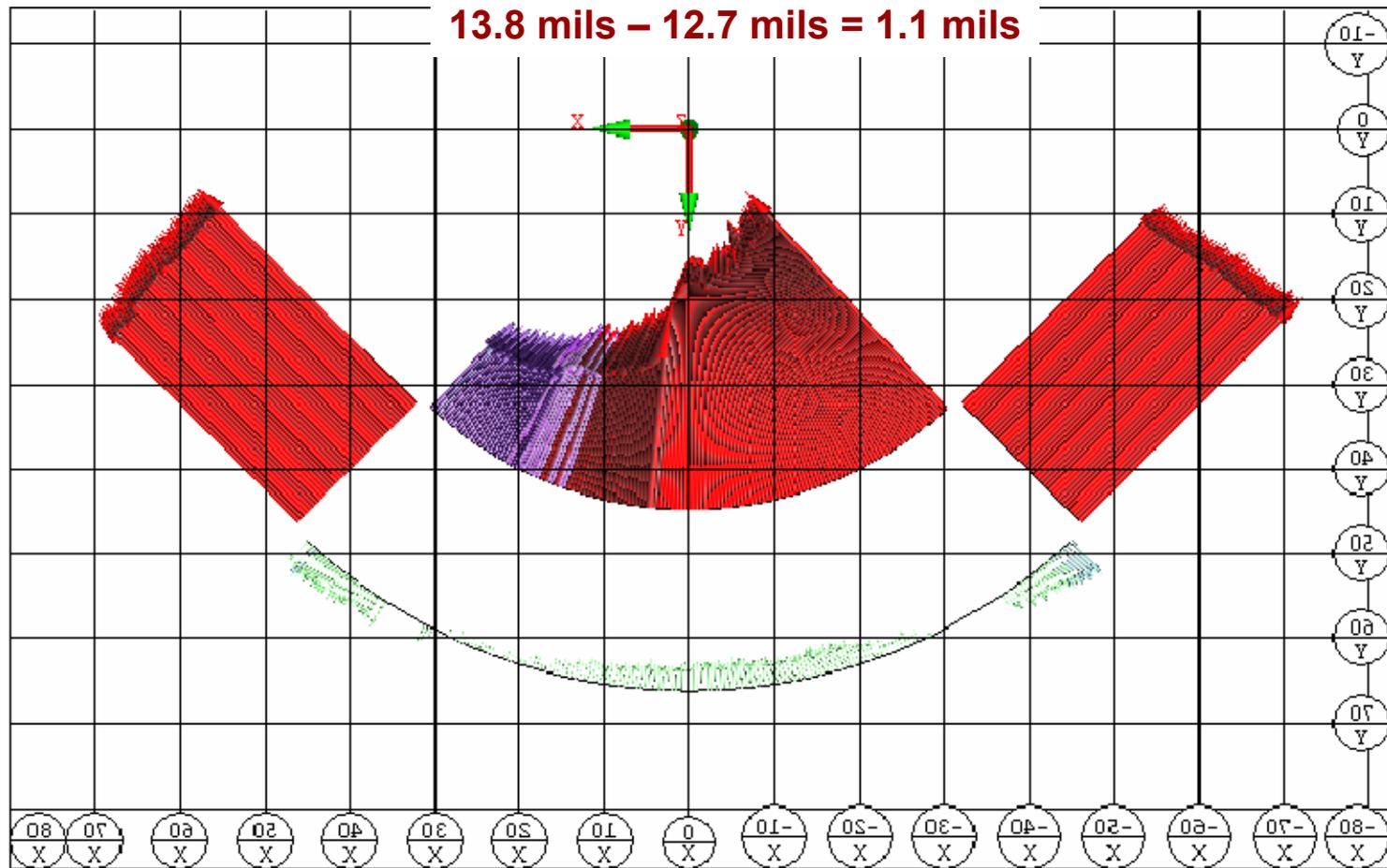
Coil 21 117mm from lead end looking from lead end

After TQS02a



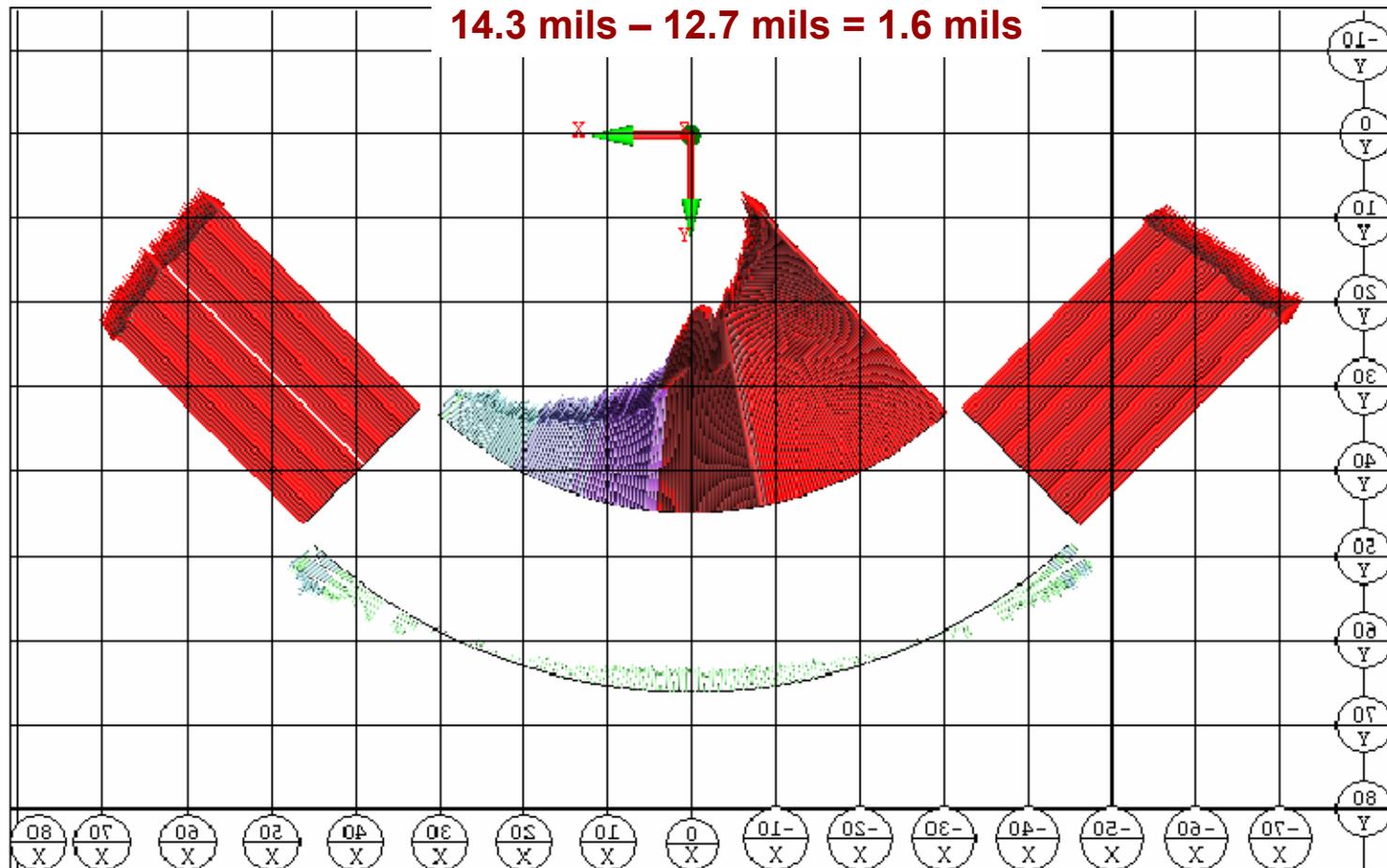
Coil 21 366mm from lead end looking from lead end

After TQS02a



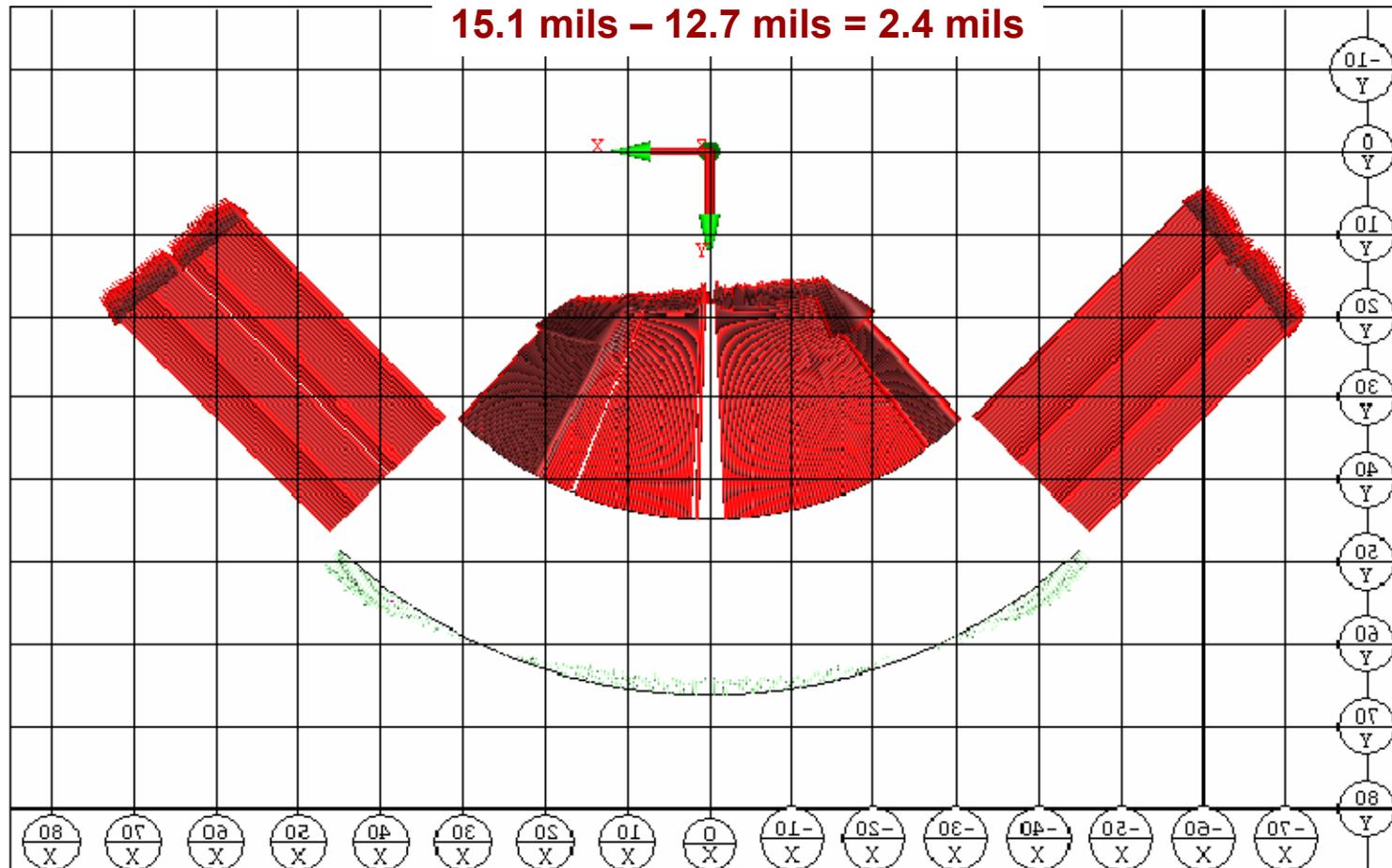
Coil 21 569mm from lead end looking from lead end

After TQS02a



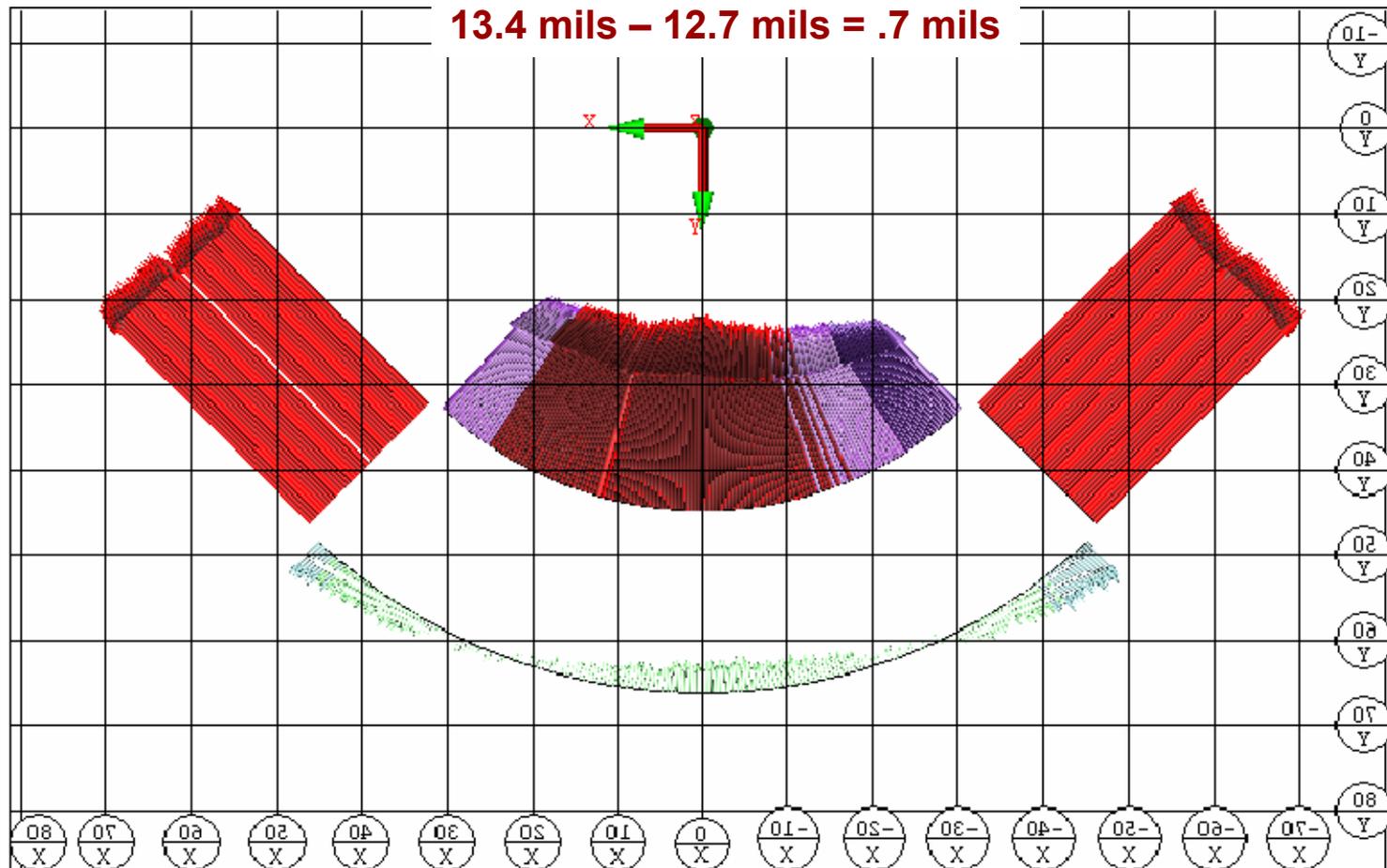
Coil 21 972mm from lead end looking from lead end

After TQS02a



Coil 22 117mm from lead end looking from lead end

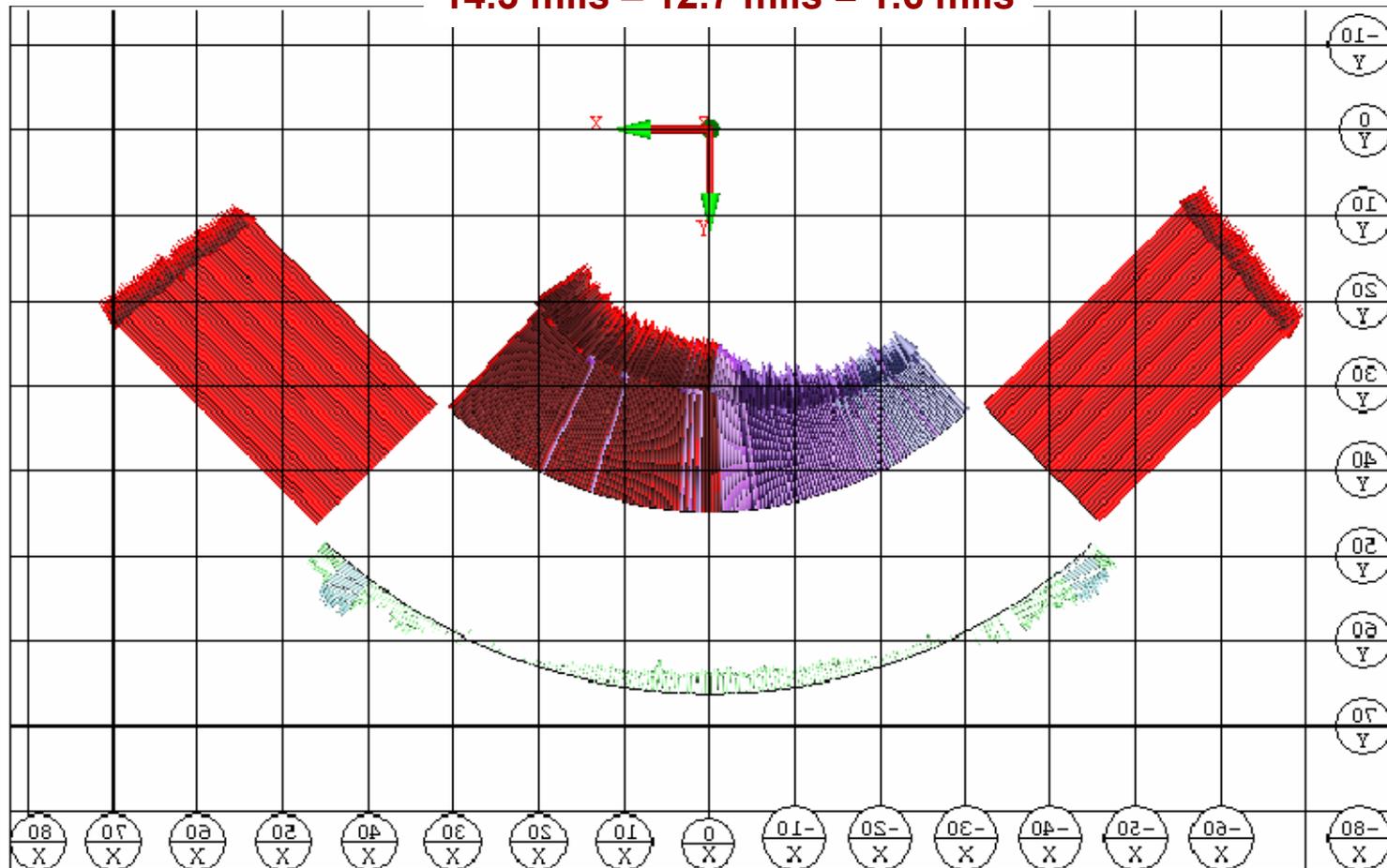
After TQS02a



Coil 22 402mm from lead end looking from lead end

After TQS02a

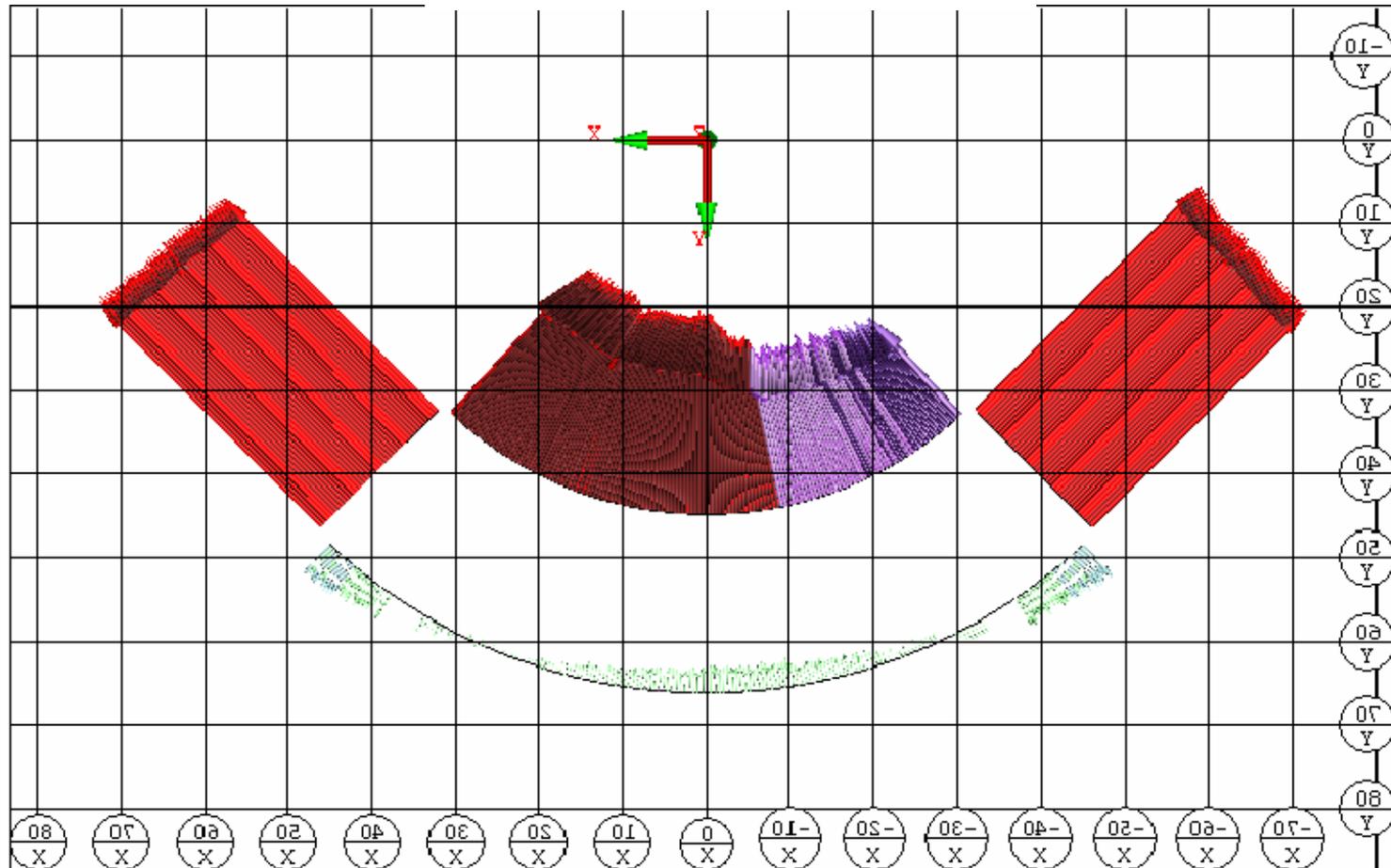
**14.3 mils – 12.7 mils = 1.6 mils**



Coil 22 544mm from lead end looking from lead end

After TQS02a

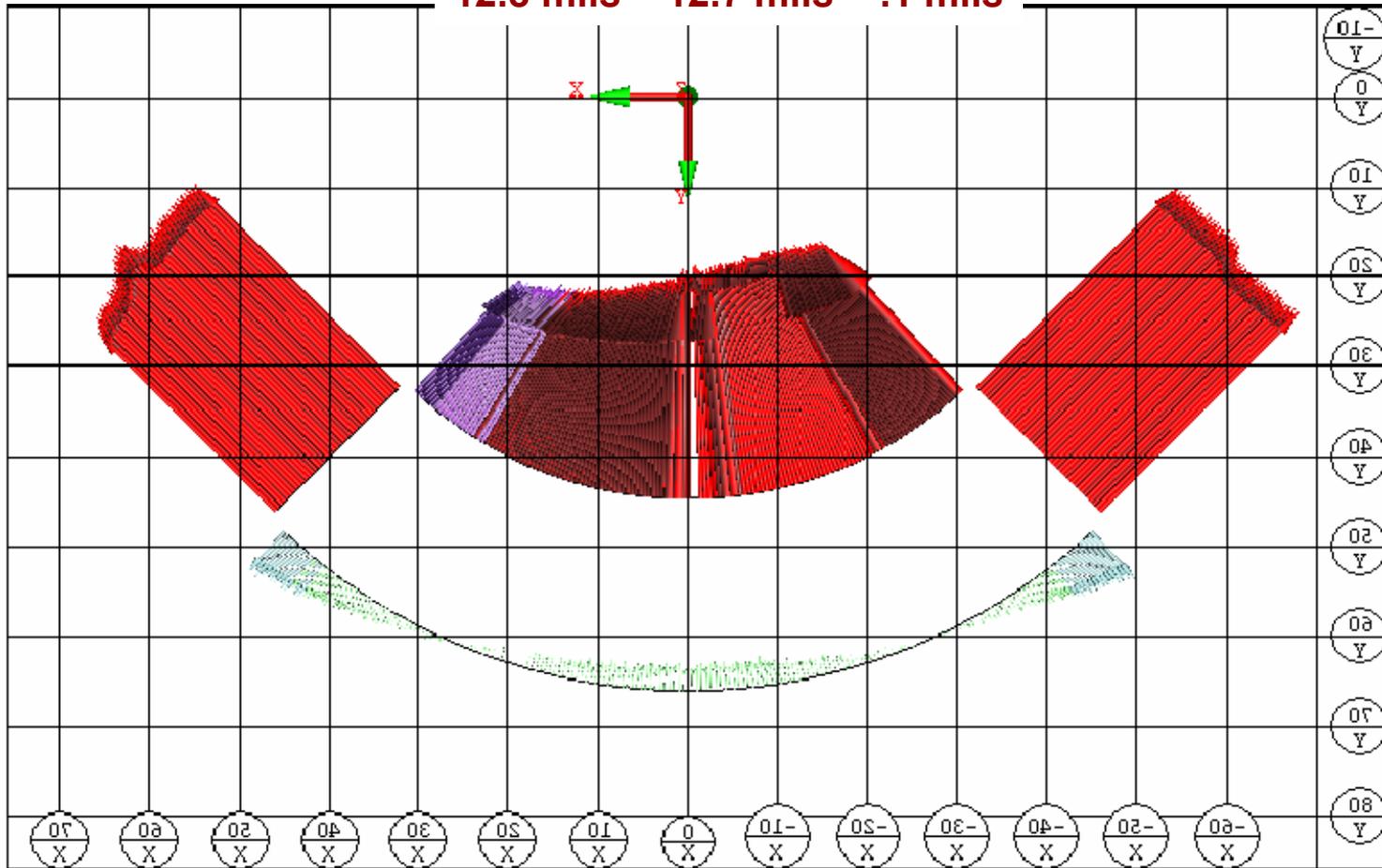
**14.7 mils – 12.7 mils = 2.0 mils**



Coil 22 972mm from lead end looking from lead end

After TQS02a

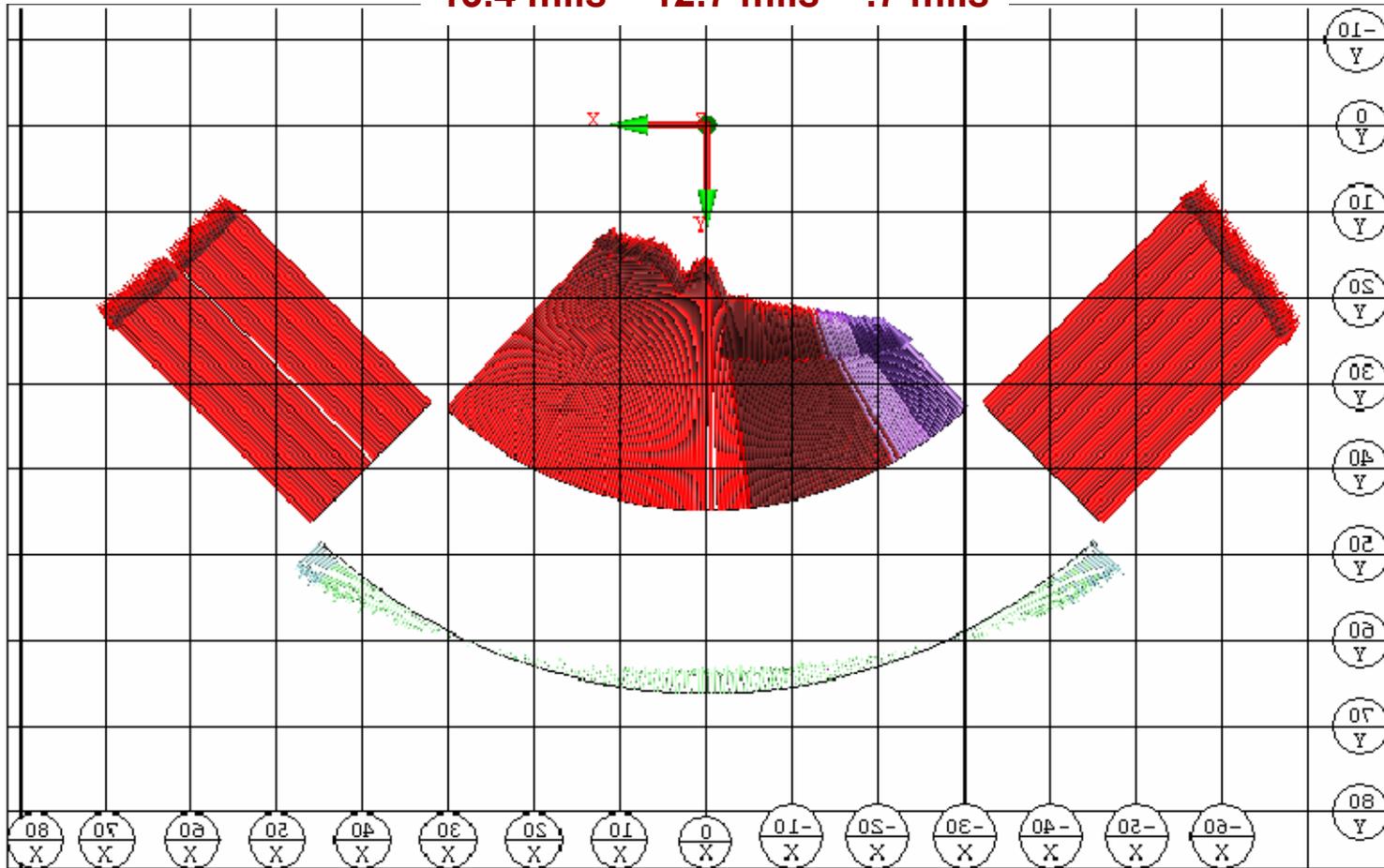
**12.8 mils – 12.7 mils = .1 mils**



Coil 23 117mm from lead end looking from lead end

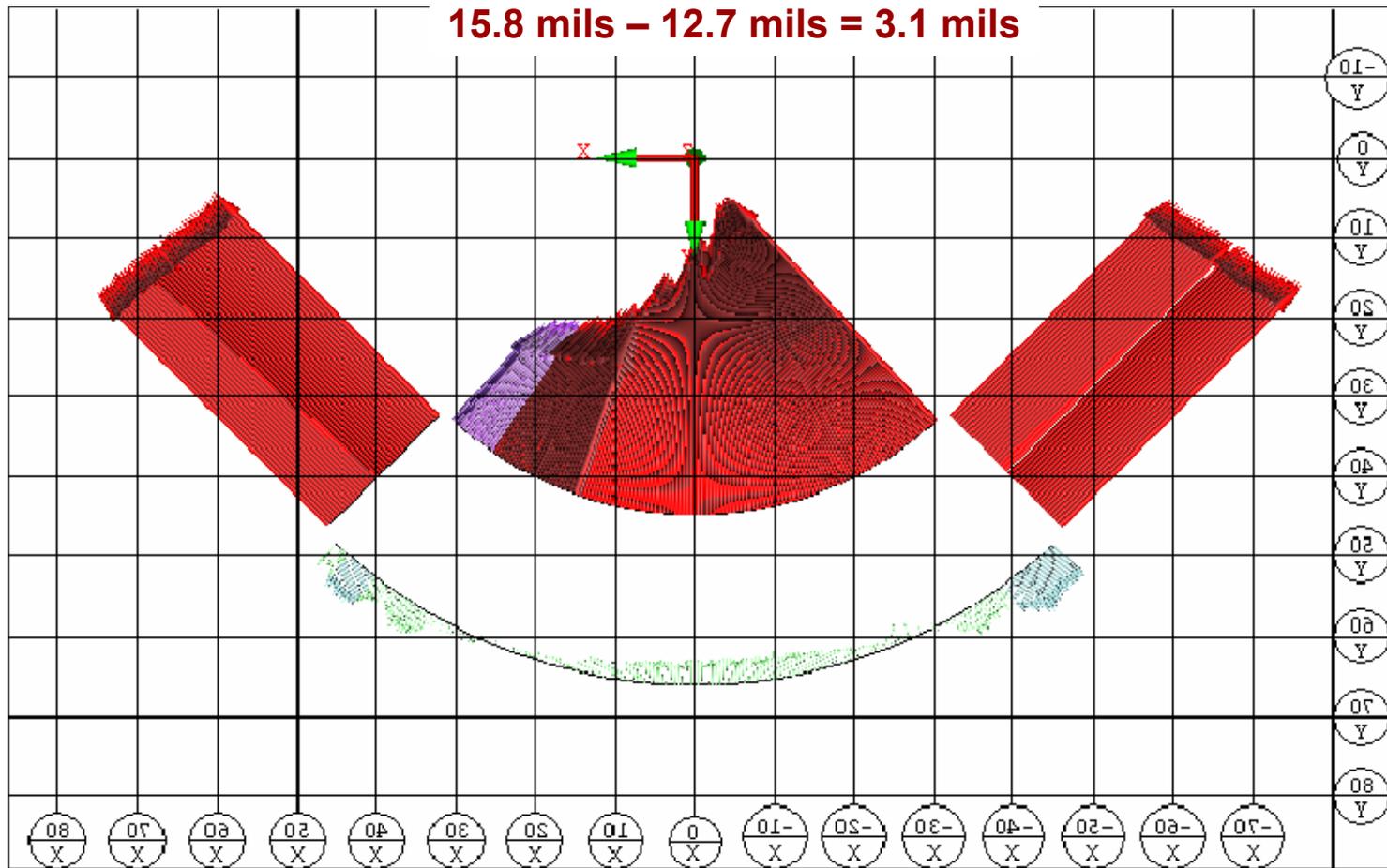
After TQS02a

**13.4 mils – 12.7 mils = .7 mils**



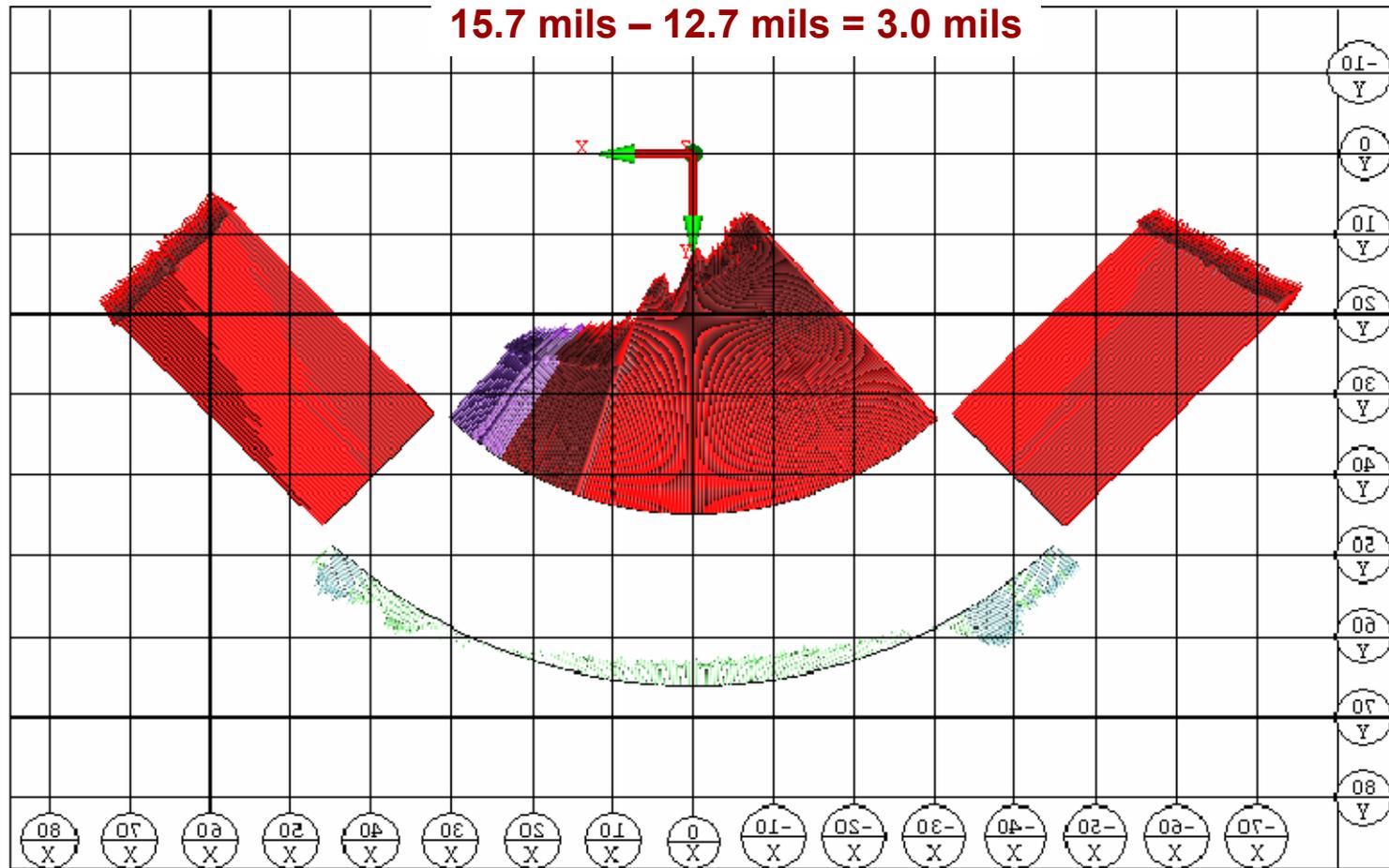
Coil 23 425mm from lead end looking from lead end

After TQS02a



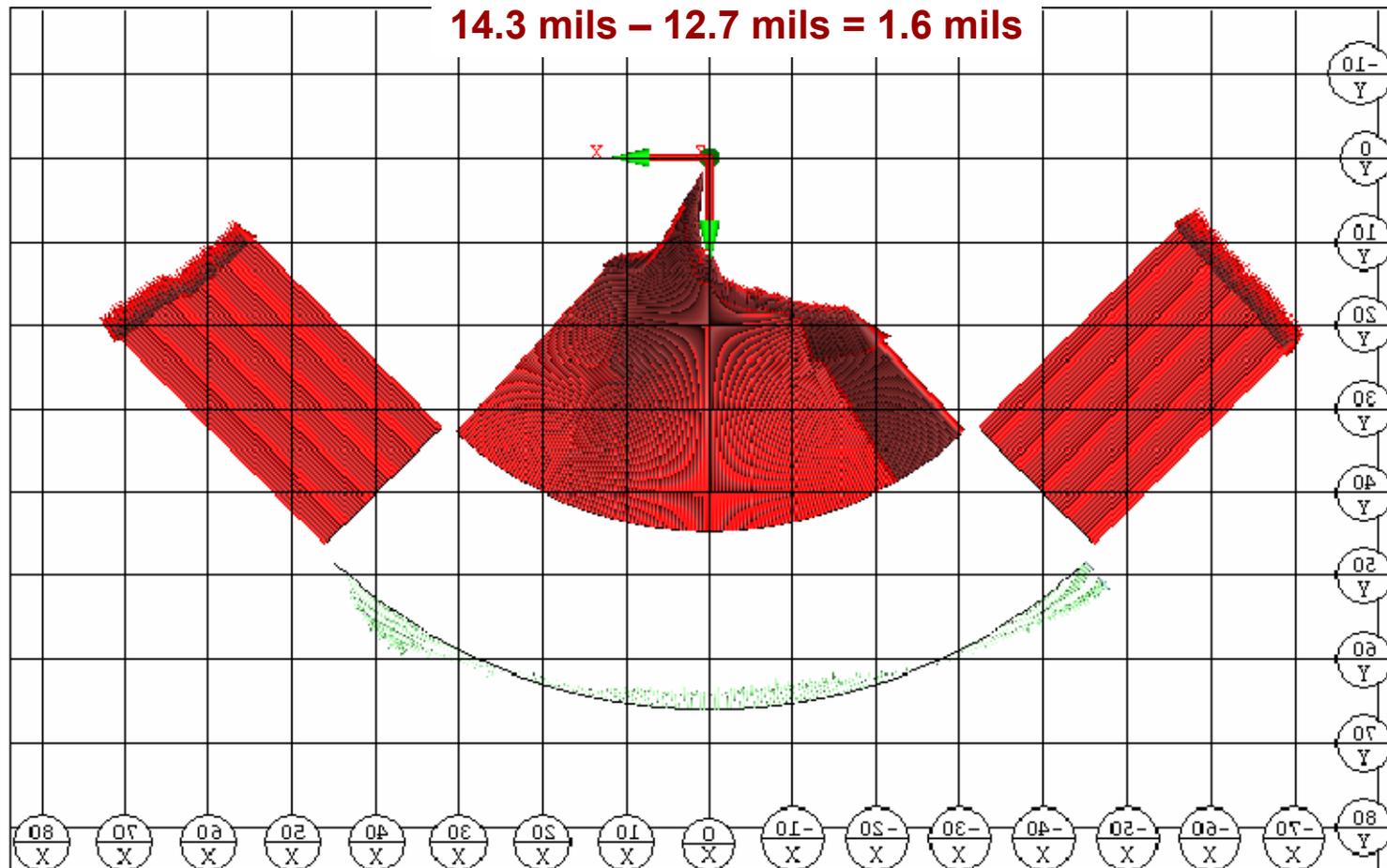
Coil 23 593mm from lead end looking from lead end

After TQS02a



Coil 23 971mm from lead end looking from lead end

After TQS02a



## TQC02E coil size (coils measured after use in TQS02a)

Size in mils (in. x 10<sup>-3</sup>) over nominal

	<b>Lead End</b>	<b>Body</b>	<b>Return End</b>
<b>TQC02E coil no.</b>			
<b>20</b>	<b>.6</b>	<b>3.0</b>	<b>0</b>
<b>21</b>	<b>2.0</b>	<b>1.4</b>	<b>2.4</b>
<b>22</b>	<b>.7</b>	<b>1.8</b>	<b>.1</b>
<b>23</b>	<b>.7</b>	<b>3.0</b>	<b>1.6</b>
<b>Mean</b>	<b>1.0</b>	<b>2.3</b>	<b>1.0</b>
<b>TQC01b coil no. (for reference)</b>			
<b>07</b>	<b>0</b>	<b>.4</b>	<b>0</b>
<b>08</b>	<b>3.5</b>	<b>.2</b>	<b>1</b>
<b>10</b>	<b>4</b>	<b>2.9</b>	<b>3</b>
<b>12</b>	<b>5</b>	<b>1.6</b>	<b>4</b>
<b>Mean</b>	<b>3.1</b>	<b>1.3</b>	<b>2</b>