

CCW - A Whole New Way to Clean the Prober

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Introduction

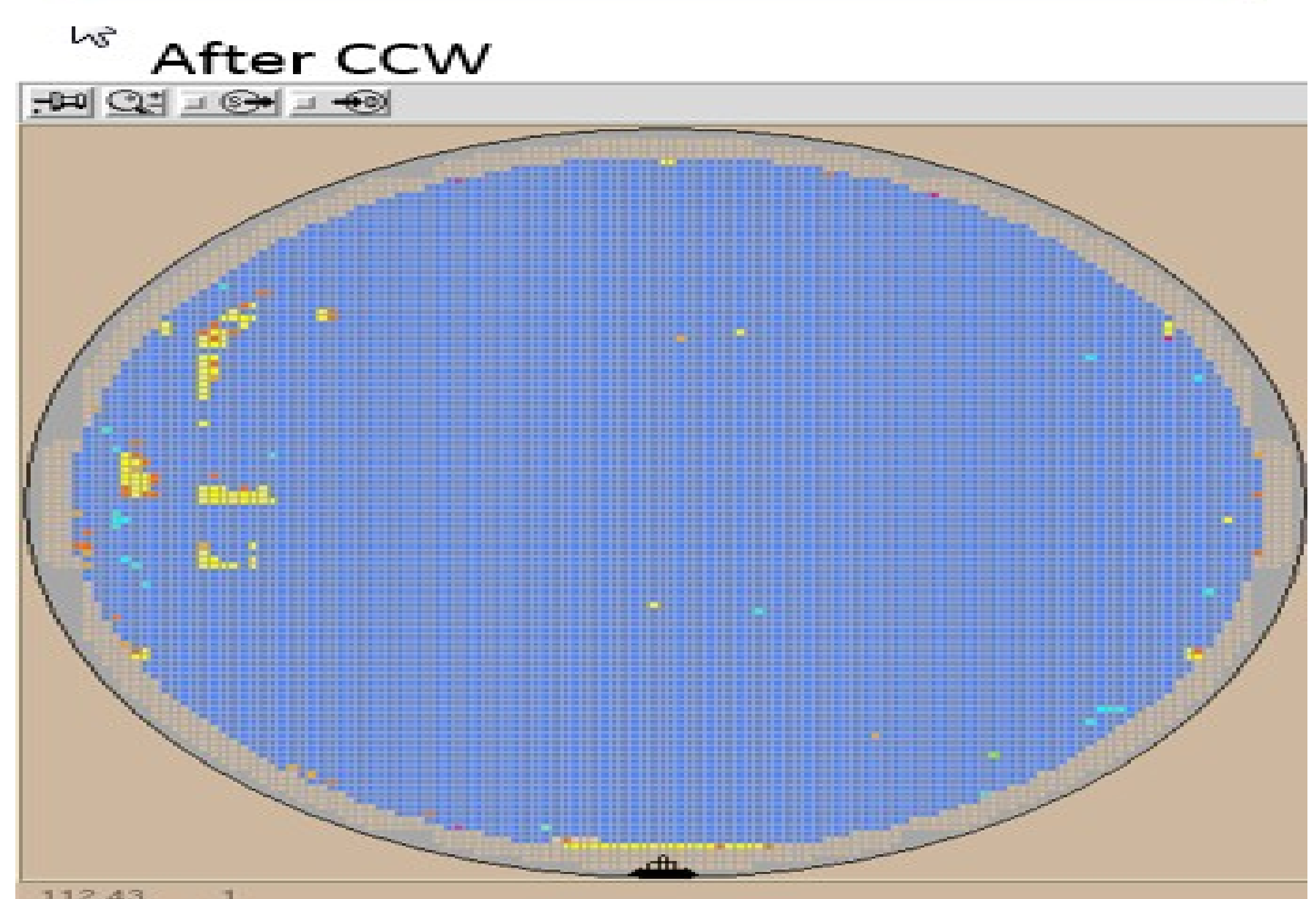
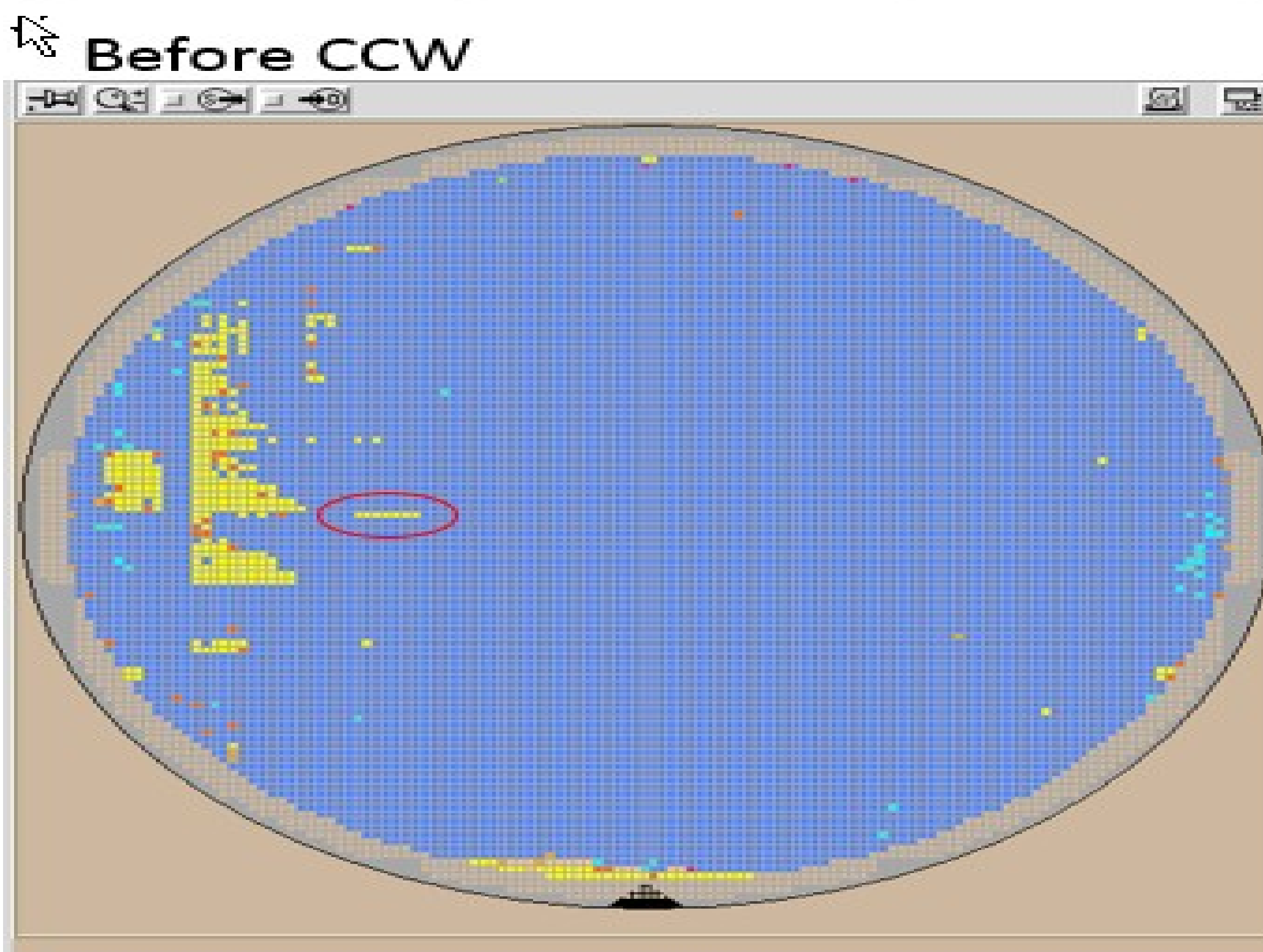
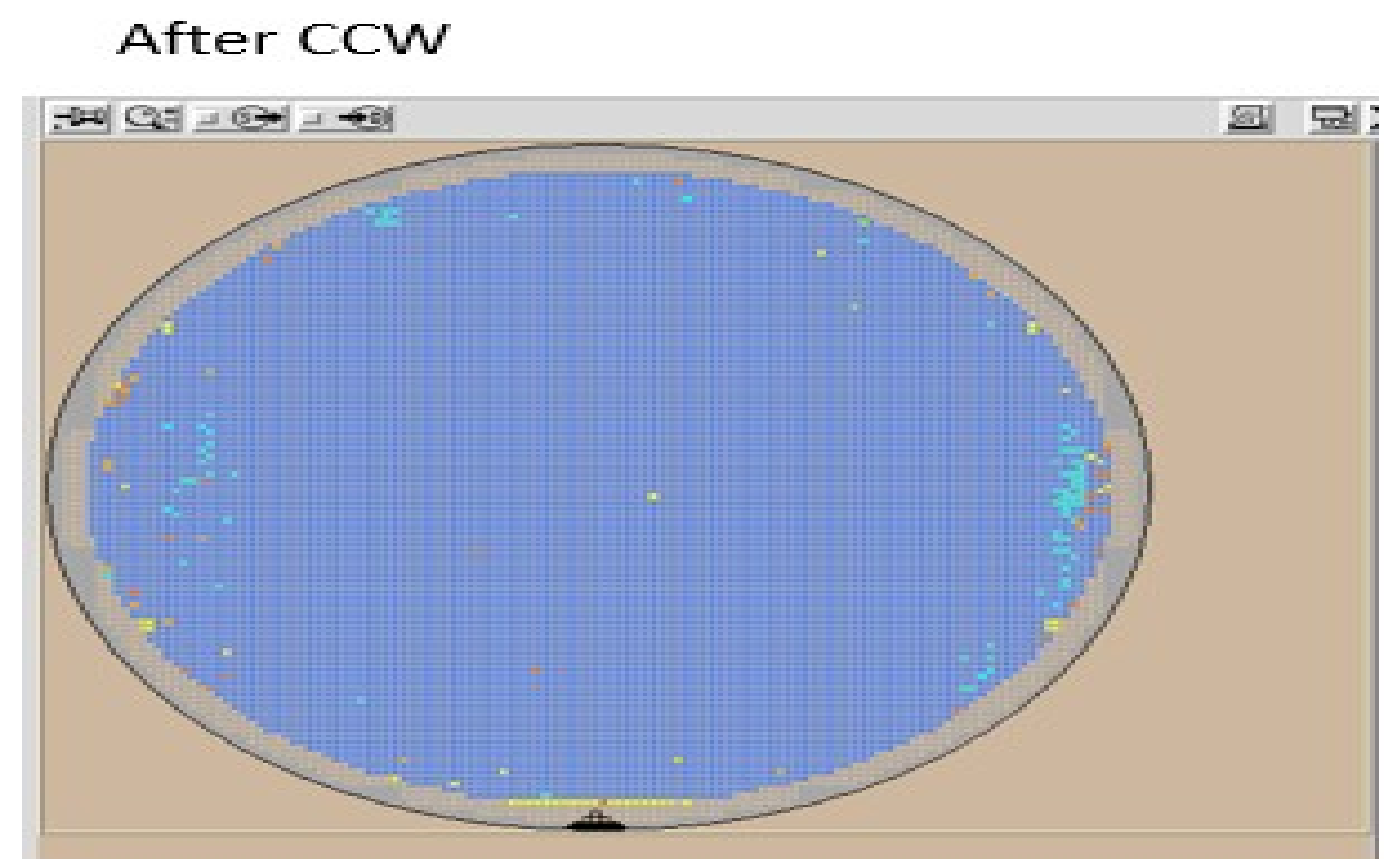
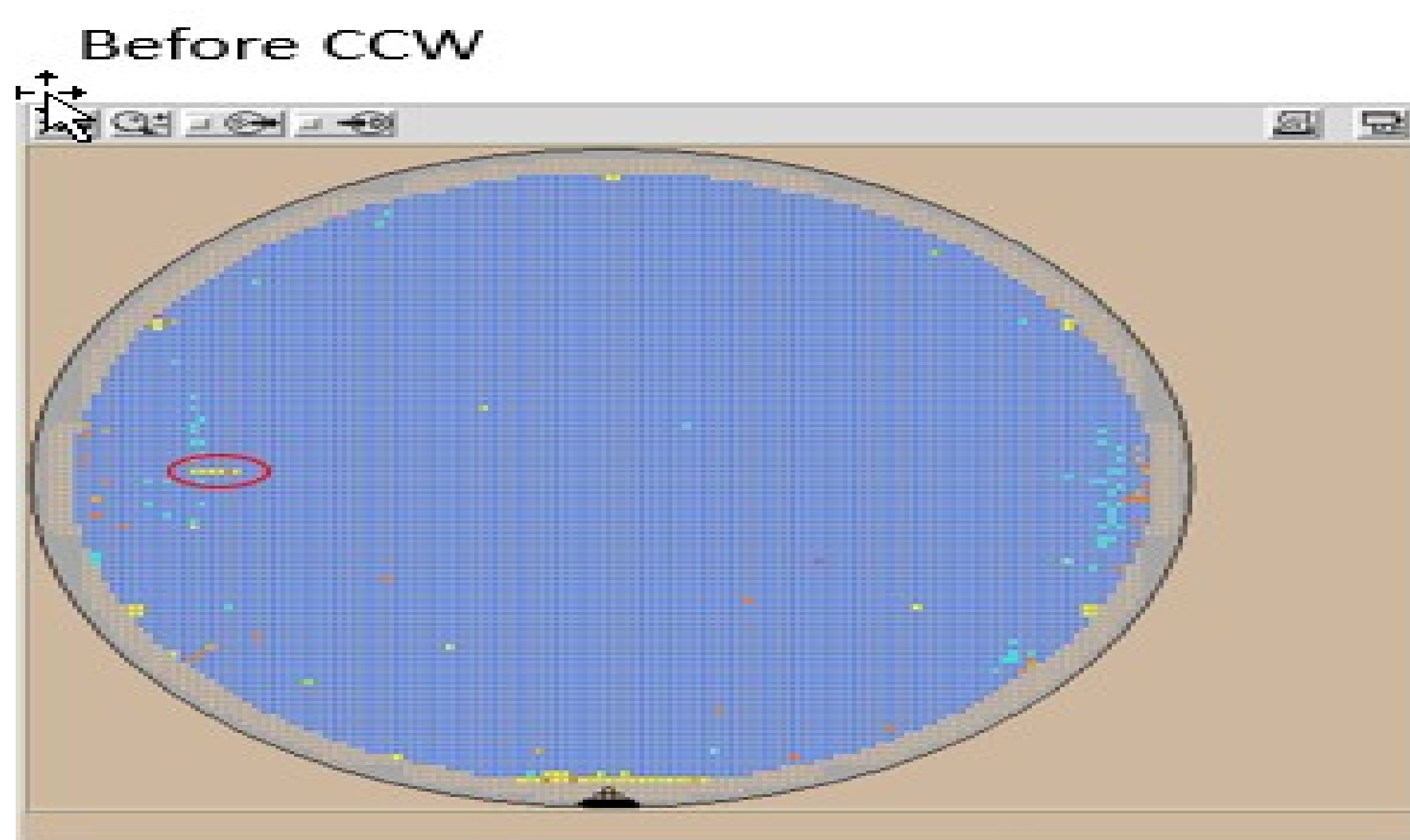
Production suffering yield loss due to particles on prober pincette arm, or chuck being transferred to the product. This resulted in lower tool availability. Production was seeking a solution to allow the particles to be removed easily and completed without need for maintenance or engineering intervention.

Method to Eliminate Prober Chuck Particles

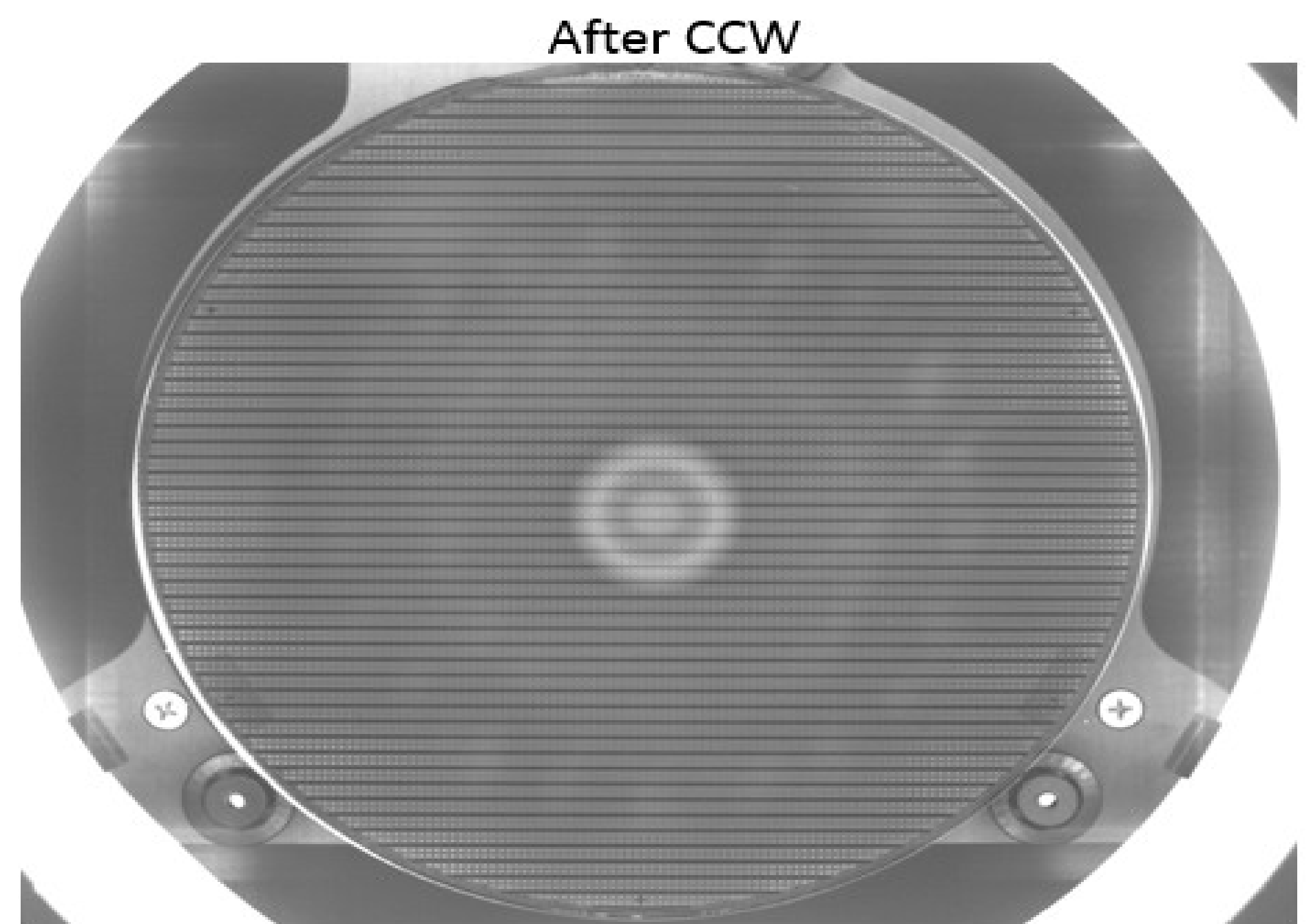
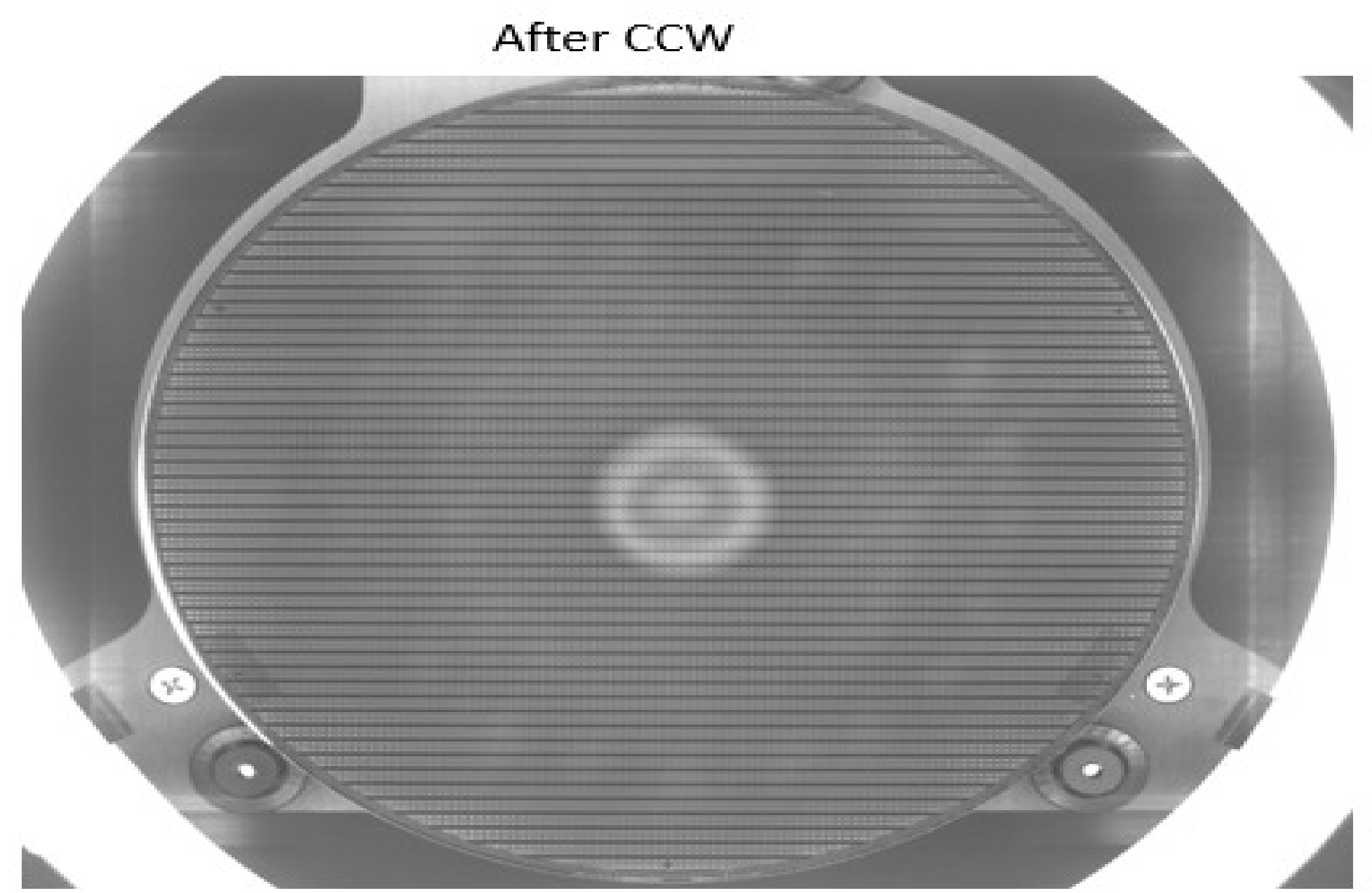
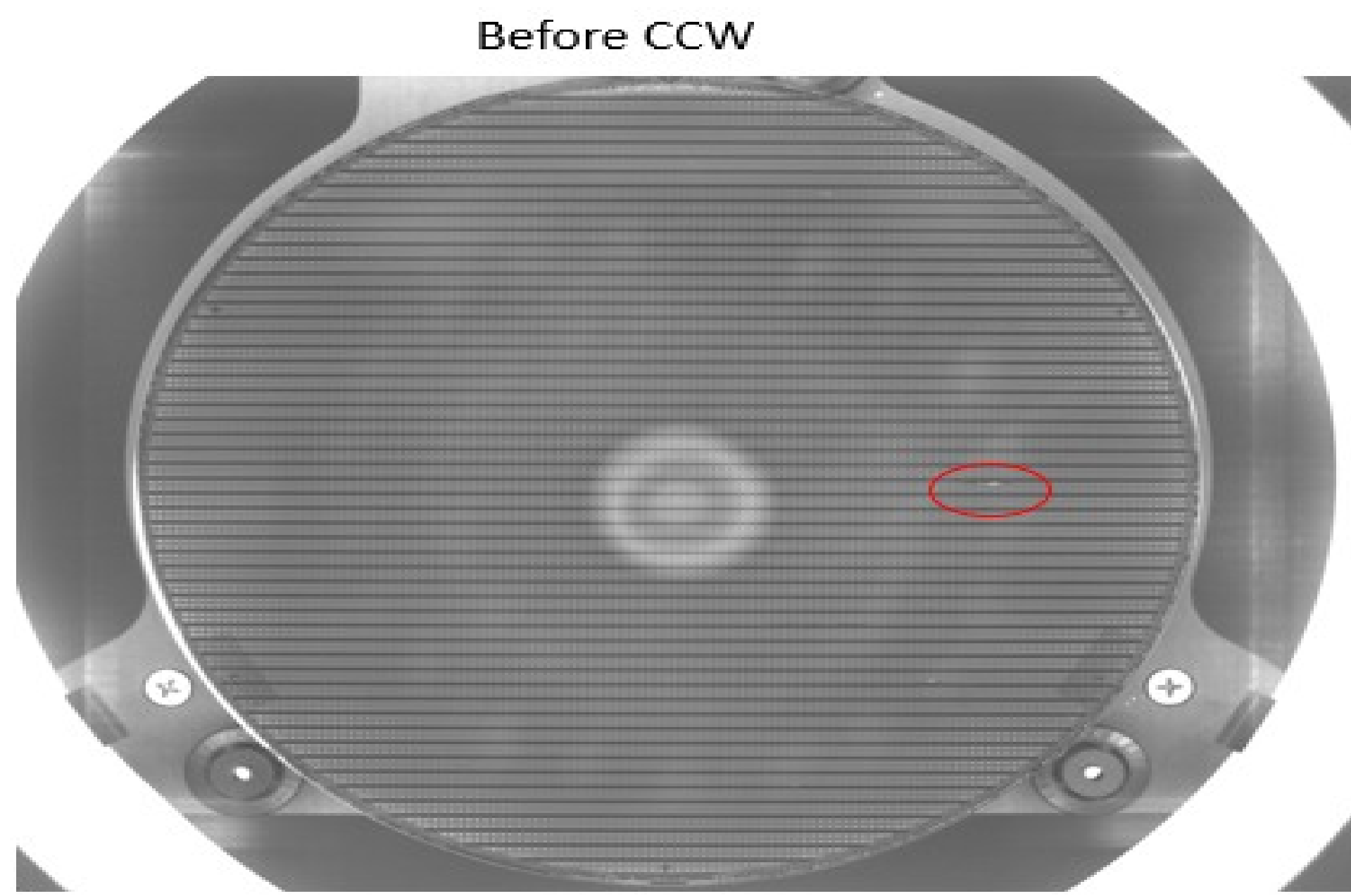
Particles on prober tool chucks can cause the wafer to be poorly aligned to the probe card and can even cause probe card damage. These particles are typically carried into the tool on the backside of wafers. The normal procedure to remove these particles is to shut down the machine and open it to clean the chuck.

The Stage Clean™ Chuck Cleaning Wafer (CCW) was developed to remove and trap the loose debris that accumulates on the wafer chuck. The Stage Clean product has a highly cross-linked polymeric material that is mounted on wafers, and the wafer is run polymer-side down through the tool.

Yield Results – Notch up



Infrared image of wafer (Notch Down) with repeating puncture from debris. Puncture resolved after CCW was cycled through prober.



TXRF Results

Before CCW

After CCW

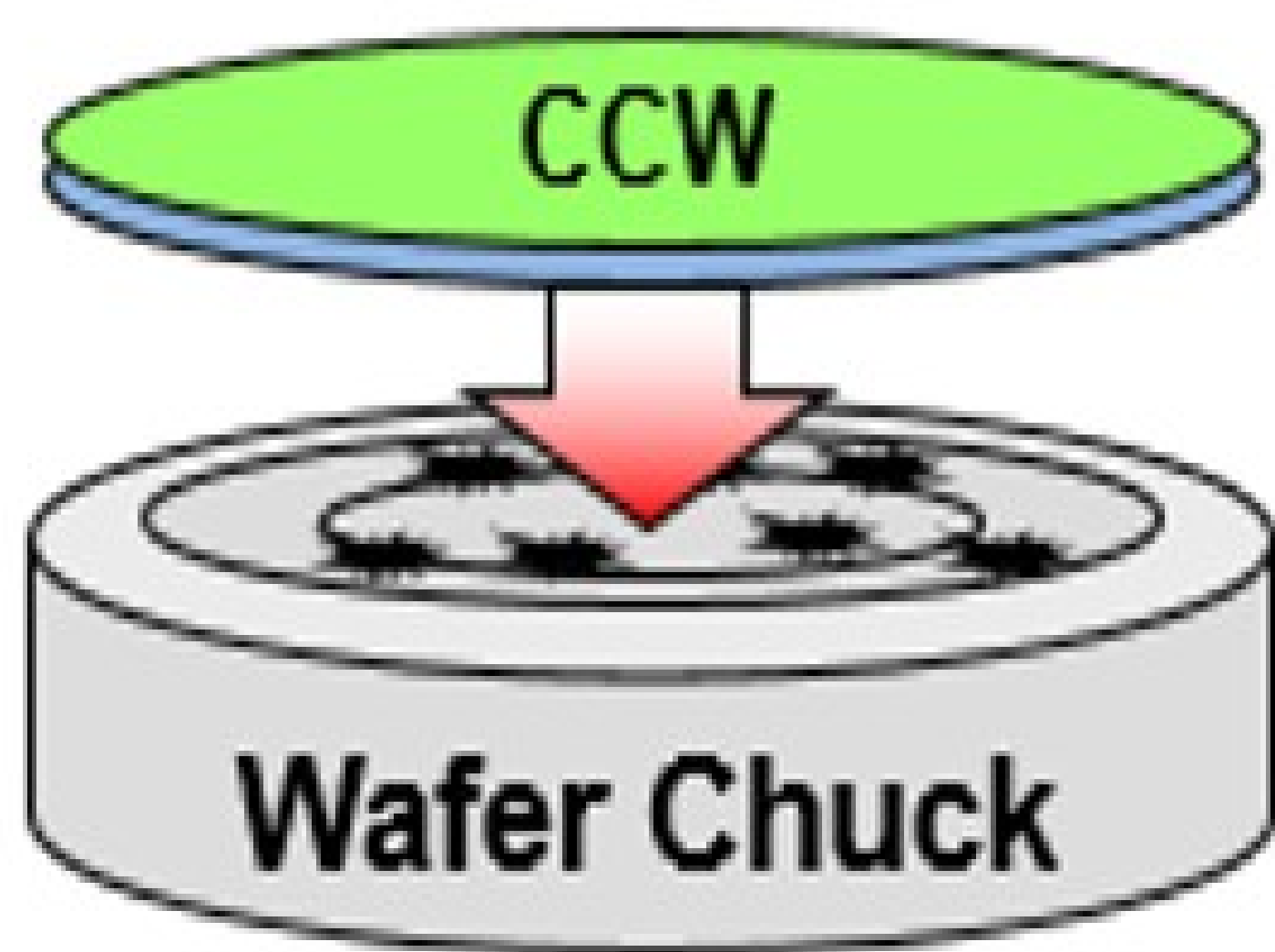
Element>	As	Br	Sr	Ta	W	Ir	Pt	Au	Pb
Detection Limit (XE10 at/cm2)	5	5	4	5	5	5	5	3	5
X:Y(mm)									
0.01:0.01	--	130	--	--	--	--	--	--	--
-30.00:30.00	--	110	--	--	--	--	--	--	--
-30.00:-30.00	--	120	--	--	--	--	--	--	--
30.00:-30.00	--	130	--	--	--	--	--	--	--
30.00:30.00	--	120	--	--	--	--	--	--	--
-57.00:57.00	--	100	--	--	--	--	--	--	--
-57.00:-57.00	--	140	--	--	--	--	--	--	--
57.00:-57.00	--	130	--	--	--	--	--	--	--
57.00:57.00	--	93	--	--	--	--	--	--	--

Element>	As	Br	Sr	Ta	W	Ir	Pt	Au	Pb
Detection Limit (XE10 at/cm2)	5	5	4	5	5	5	5	3	5
X:Y(mm)									
0.01:0.01	--	48	--	--	--	--	--	--	--
-30.00:30.00	--	68	--	--	--	--	--	--	--
-30.00:-30.00	--	72	--	--	--	--	--	--	--
30.00:-30.00	--	64	--	--	--	--	--	--	--
30.00:30.00	--	40	--	--	--	--	--	--	--
-57.00:57.00	--	110	--	--	--	--	--	--	--
-57.00:-57.00	--	150	--	--	--	--	--	--	--
57.00:-57.00	--	150	--	--	--	--	--	--	--
57.00:57.00	--	90	--	--	--	--	--	--	--

Element>	S	K	Ca	Ti	Cr	Mn	Fe	Ni	Cu	Zn	Ag	Sb
Detection Limit (XE10 at/cm2)	19	6	6	3	2	1	1	1	1	2	5	5
X:Y(mm)												
0.01:0.01	890	--	88	28	--	--	8	--	--	5	--	--
-30.00:30.00	970	--	37	21	--	--	16	--	--	7	--	--
-30.00:-30.00	650	25	48	--	--	--	22	--	--	--	--	--
30.00:-30.00	760	21	140	5	--	--	22	2	--	--	--	--
30.00:30.00	790	51	210	19	25	--	130	72	--	10	--	--
-57.00:57.00	400	19	87	--	--	--	18	2	--	--	--	--
-57.00:-57.00	320	--	310	330	--	--	44	3	--	140	--	--
57.00:-57.00	230	--	8	--	--	--	13	3	--	15	--	--
57.00:57.00	350	--	20	--	21	--	93	16	--	--	--	--

Element>	S	K	Ca	Ti	Cr	Mn	Fe	Ni	Cu	Zn	Ag	Sb
Detection Limit (XE10 at/cm2)	19	6	6	3	2	1	1	1	1	2	5	5
X:Y(mm)												
0.01:0.01	480	--	27	--	26	2	96	11	--	--	--	--
-30.00:30.00	530	--	--	--	--	--	7	1	--	--	--	--
-30.00:-30.00	570	--	22	8	--	--	13	4	--	--	--	--
30.00:-30.00	520	--	27	--	--	--	4	3	--	--	--	--
30.00:30.00	510	--	8	--	5	--	24	3	--	--	--	--
-57.00:57.00	410	--	--	--	--	--	14	2	--	--	--	--
-57.00:-57.00	410	--	--	--	--	--	7	1	--	--	--	--
57.00:-57.00	400	200	--	--	--	--	2	1	--	--	--	--
57.00:57.00	360	--	24	--	3	--	15	4	--	--	--	--

Summary:



Cycle with polymer side down when debris is present on chuck



- **Chuck Clean Wafer (CCW) successfully removed the particles from the proper surfaces contacting the wafer.**
- **No additional contaminants left on the surfaces as evidence by the TXRF results.**
- **Future work to include:**
 - Setting up fixturing to clean the CCW and release this process to manufacturing
 - Set up tracking for the CCW to monitor when the wafer needs cleaned
 - Monitor and adjust accordingly the lifetime limits of the CCW
- **Plan to investigate the use of the CCW to other applications:**
 - Cleaning membrane surface on Cascade Core

Questions ?

If you have any questions, please contact

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