



IEEE SW Test Workshop

Semiconductor Wafer Test Workshop


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A Probe Data Collection System Test Head Cummap (THC)



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Background

- **HVM wafer test**
- **Probe damage observations** 
- **Infrequent, but catastrophic**
- **Root cause incident**
- **Large wafer defects**
- **Silent killers**
- **Need a data collection system**
- **TestHeadCummap (THC)**




THC Objectives

- Document the probe damage
- Analyze information
- Trends, Paretos, Cummaps
- Drive solutions



THC Methods

- **Excel[©] spreadsheets**
- **Macro for simple data entry** 
- **SAS JMP[©] script**
- **Database created**
- **Graphs: Trend, pareto, and cummap**



Results

- **THC output revealed systematic regions for probe burning**
- **THC trends provided evidence of turn-on and turn-off**
- **THC Paretos showed specific power planes for further scrutiny**
- **THC graphs compared cross factory and cross products**



Summary

- **Consolidate probe damage information**
- **Cumulate across fleet of probe cards**
- **Use statistical methods to find outliers**
- **Drive solutions to reduce probe energy**
- **Save \$\$\$ in probe card costs**



Next Steps

- **Some weaknesses of THC:**
 - Hundreds of Excel files
 - Fragmented database
 - Inadvertent spreadsheet changes
- **A new tool is in development today**
 - Uses a web-based interface for technicians
 - Stores probe damage in SQL database



Acknowledgements

- **The following Intel employees were crucial to the success of the THC program:**
 - Robert Miller: F11x
 - Jesus Martinez Ponce: AFO
 - Peter Truong: D1C





Obrigado!

谢谢你

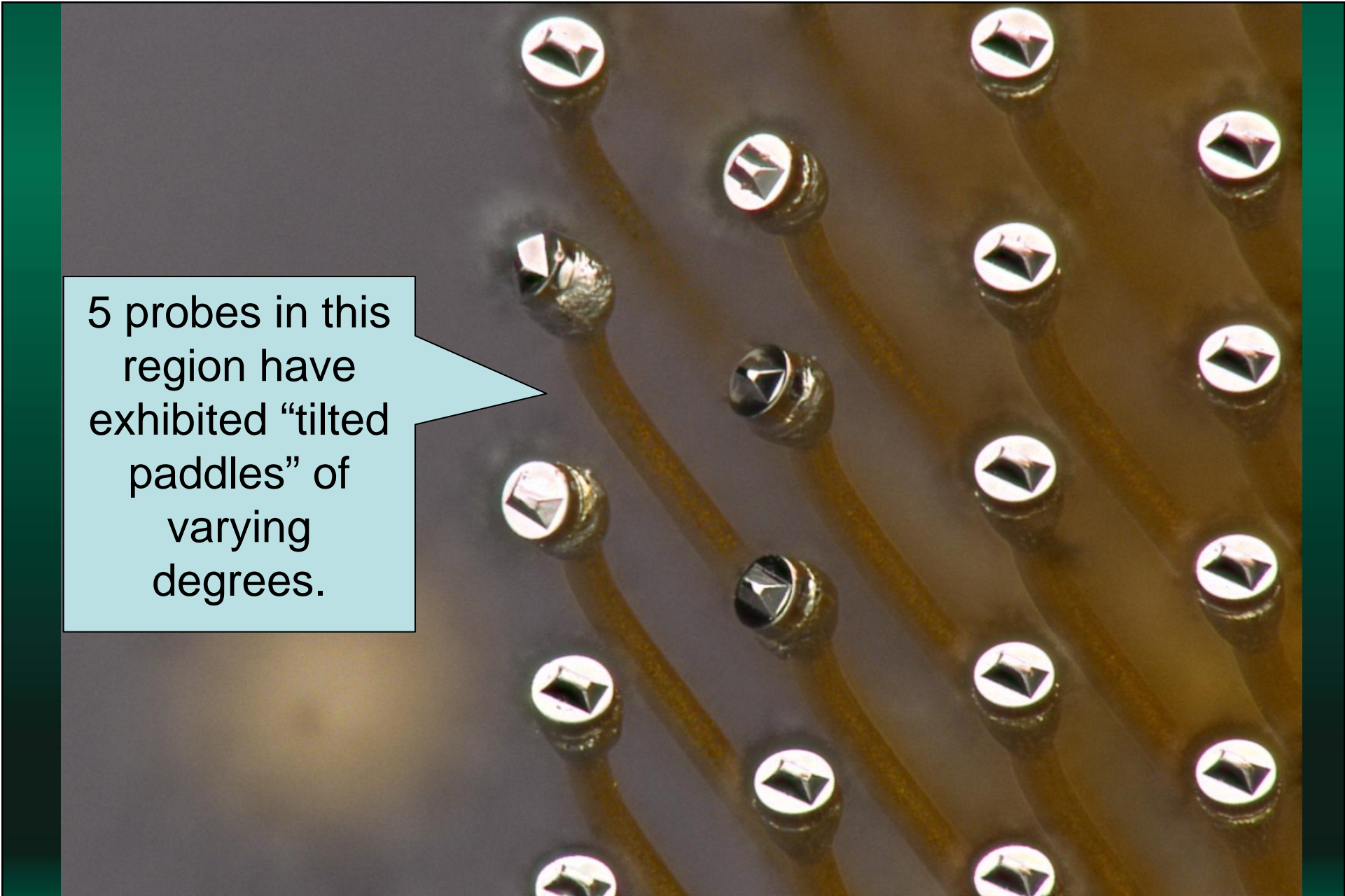


THANK YOU



Merci



A microscopic image of a probe array. The array consists of several parallel rows of probes. Each probe has a circular top surface with a central, diamond-shaped or triangular feature. The probes are arranged in a grid-like pattern. A light blue callout box with a pointer is positioned on the left side of the image, pointing to a specific region of the array.

5 probes in this region have exhibited “tilted paddles” of varying degrees.

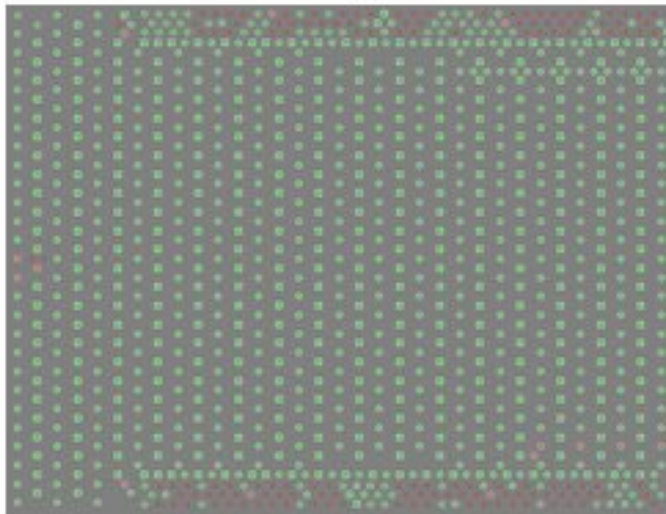
Visuals are performed



Open the padmap file



Find the probe



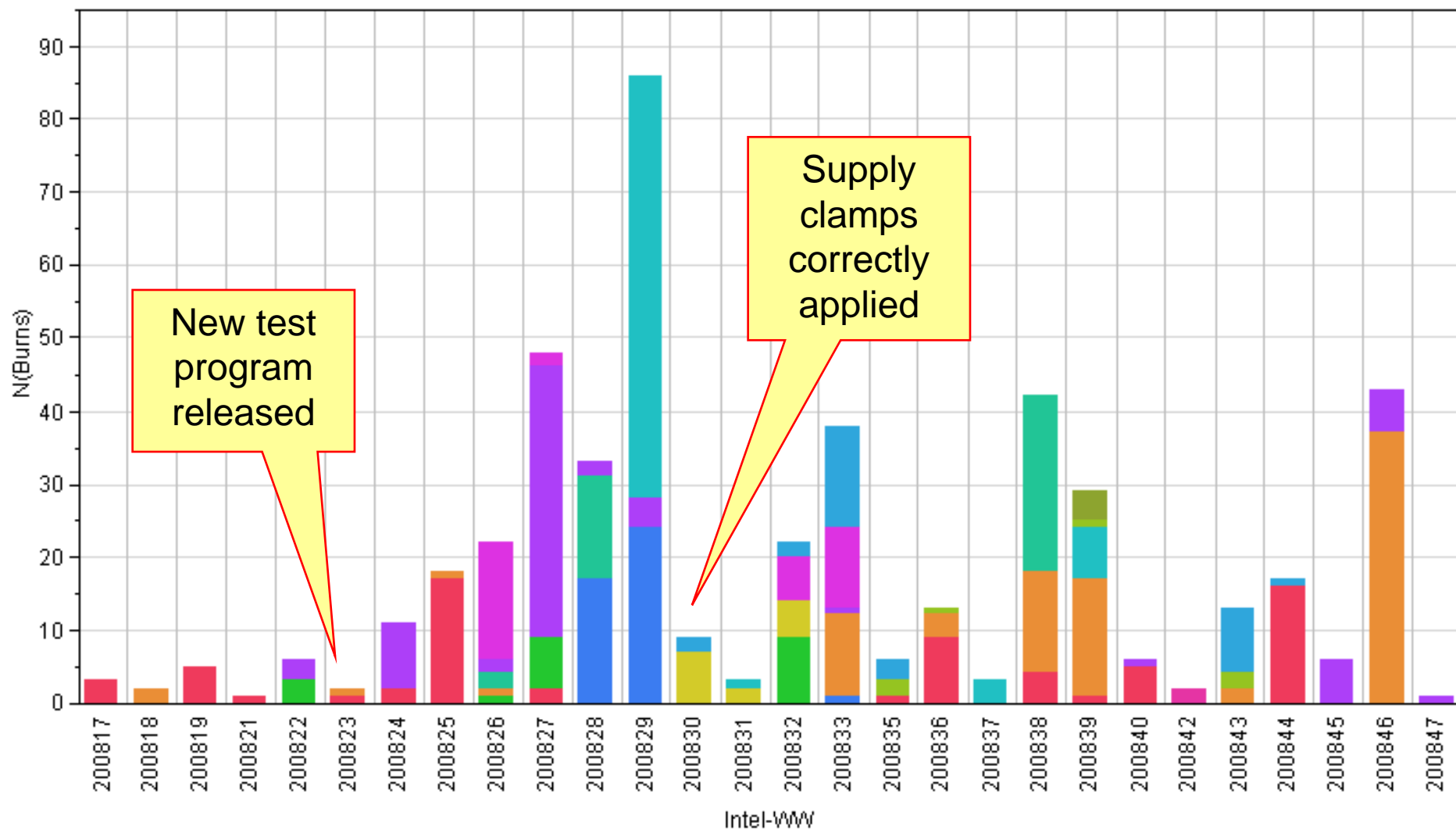
Update probe damage



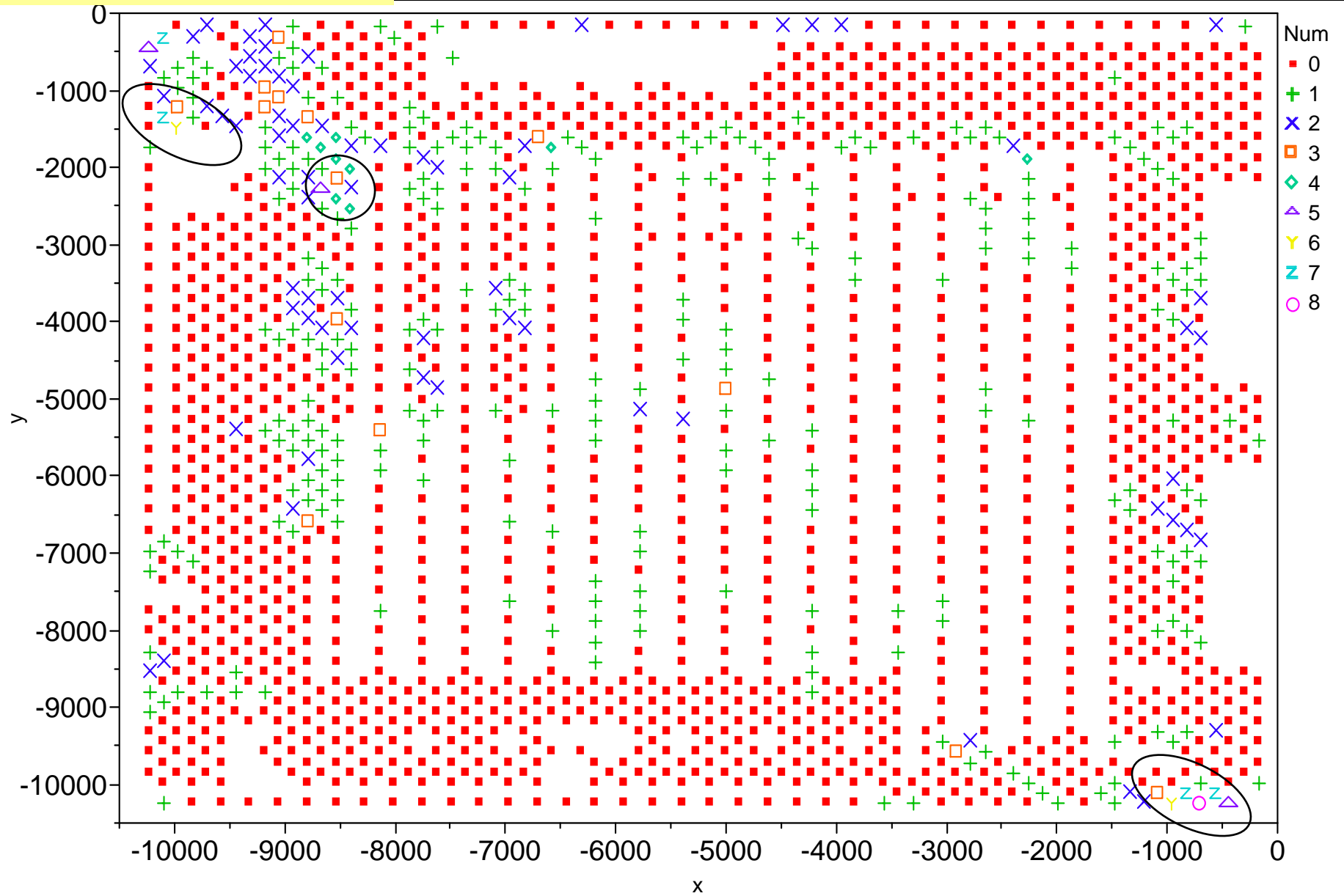
Save the padmap file



Burn Rate Trend - F11X CTAT - by Workweek



THC Cummap Example



Probe Burn Cummap - AFO CTAT - by X,Y location

