FEINMETALL
Contact technologies for electronics

Prober Stability with Large Probing Area and High Pincount

How prober deflection affects large area/high pincount memory testing

by

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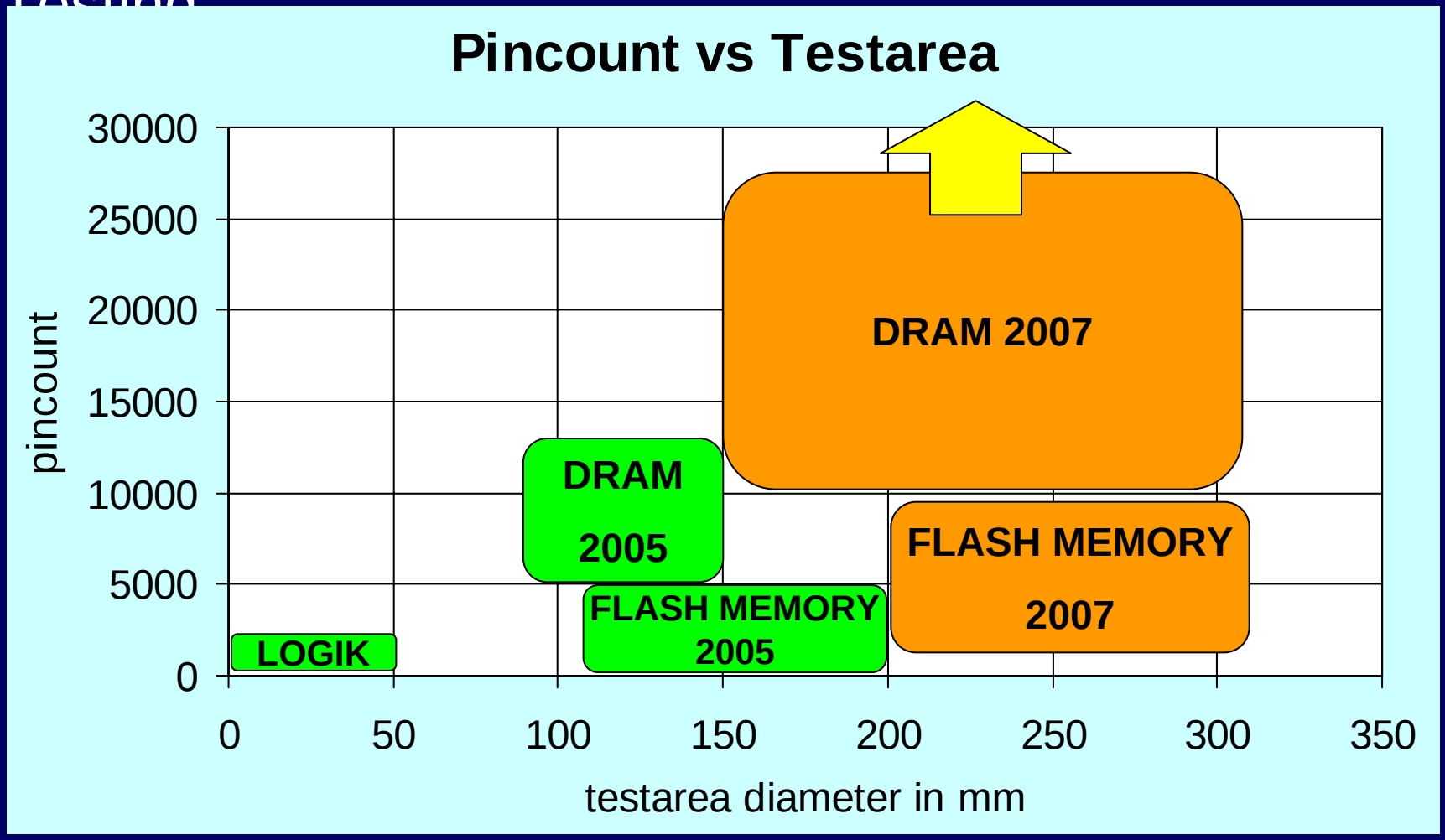
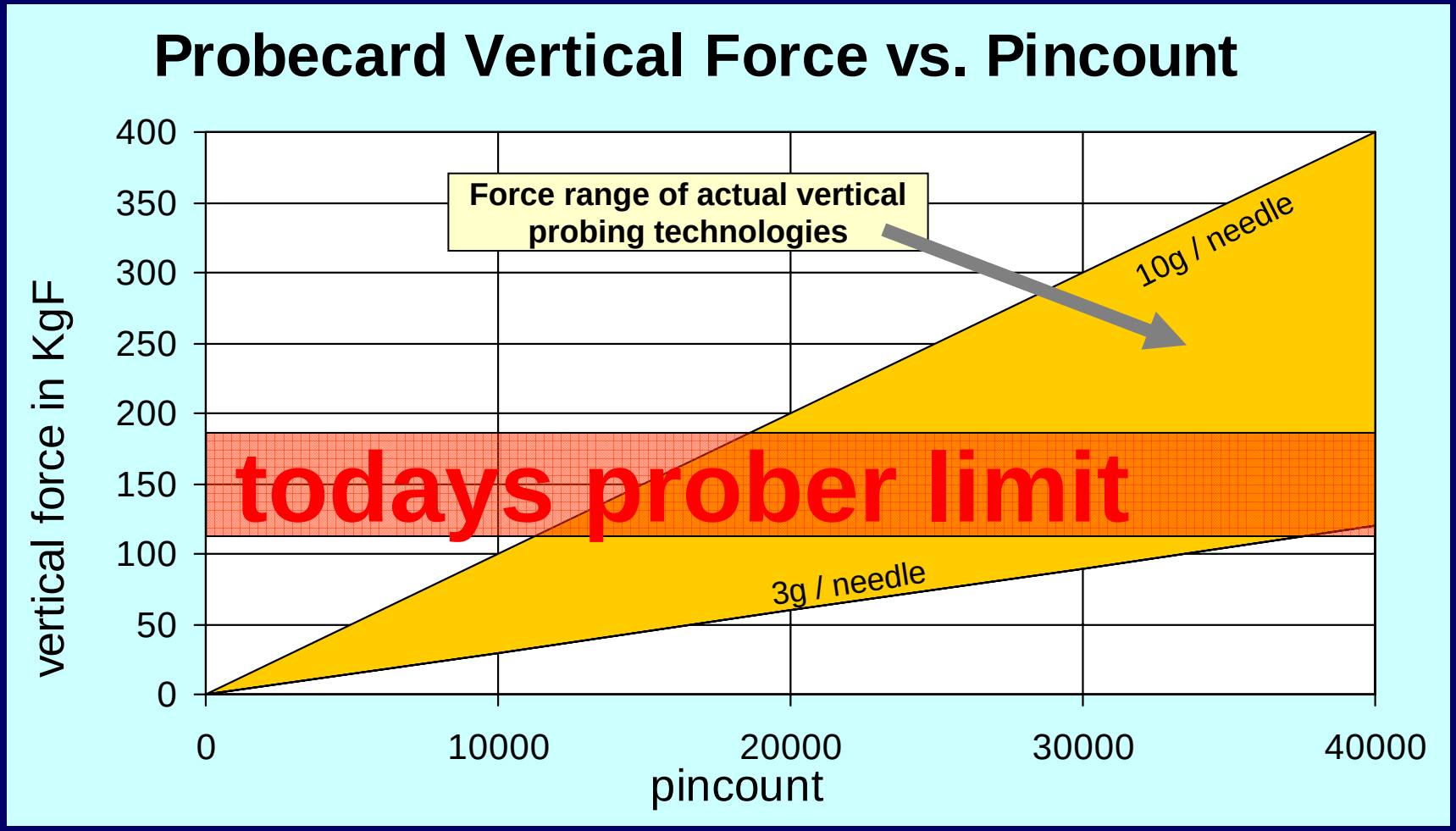
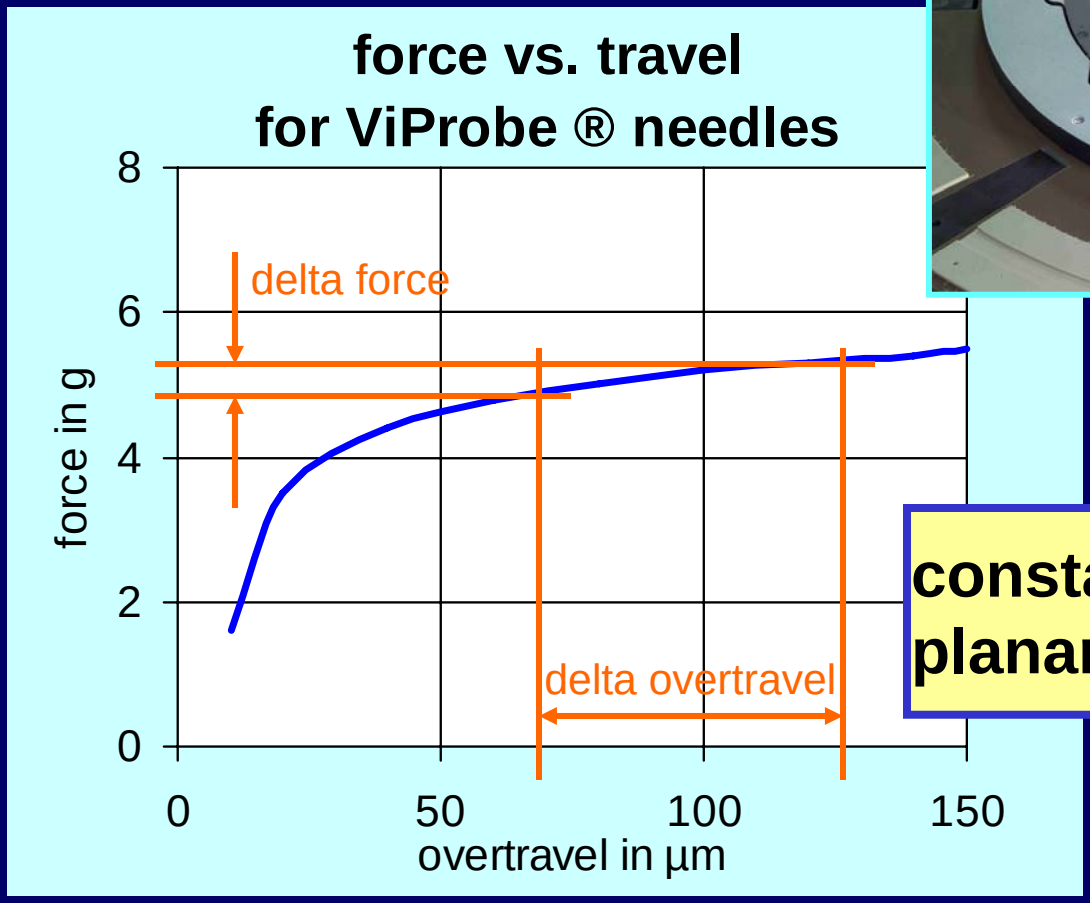
Typical Pincount and Testarea Values for Memory Testing



High Pincount Testing with Actual 300mm Prober



ViProbe Force vs. Overtravel



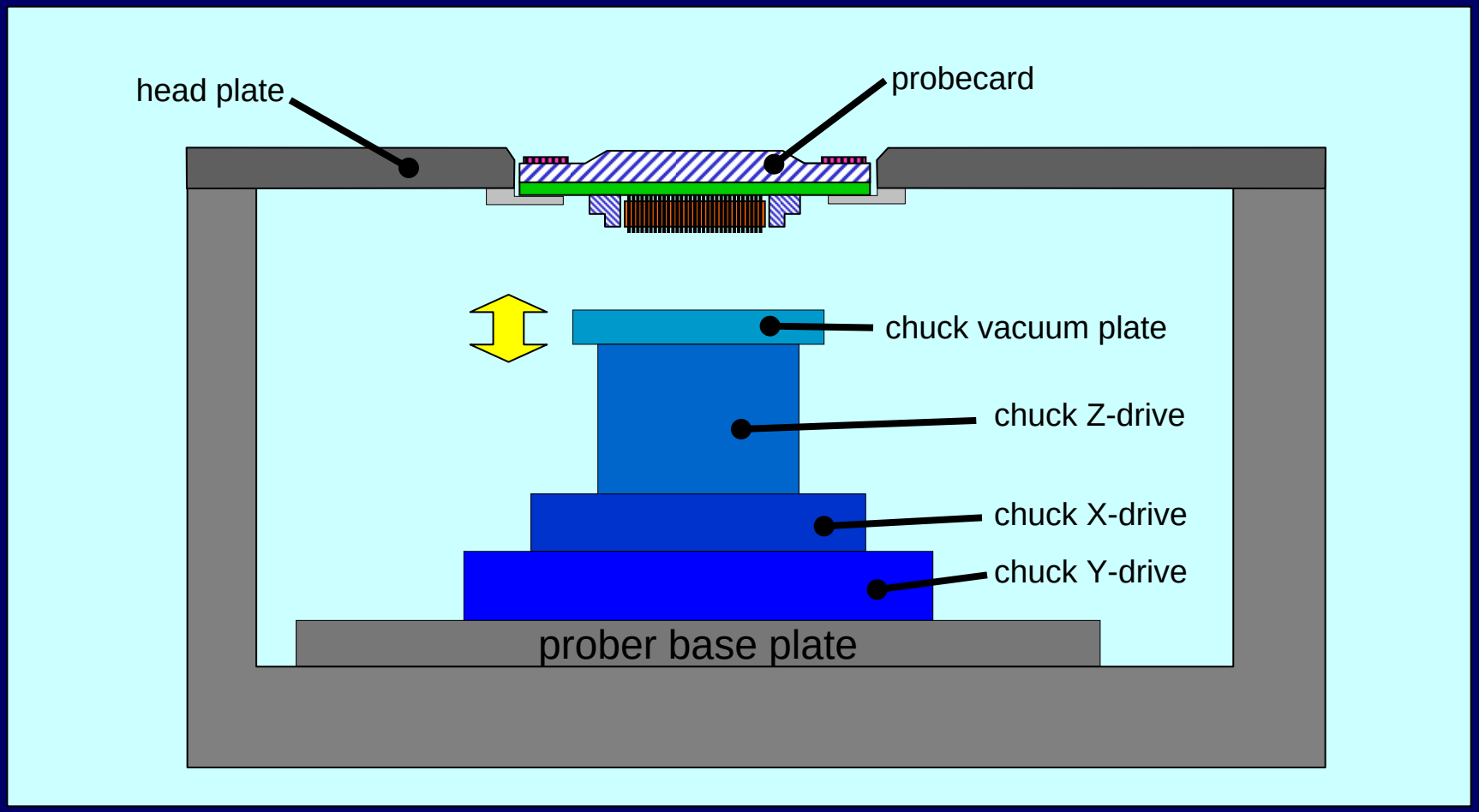
constant force on wide planarity range

Objective of the Experiment

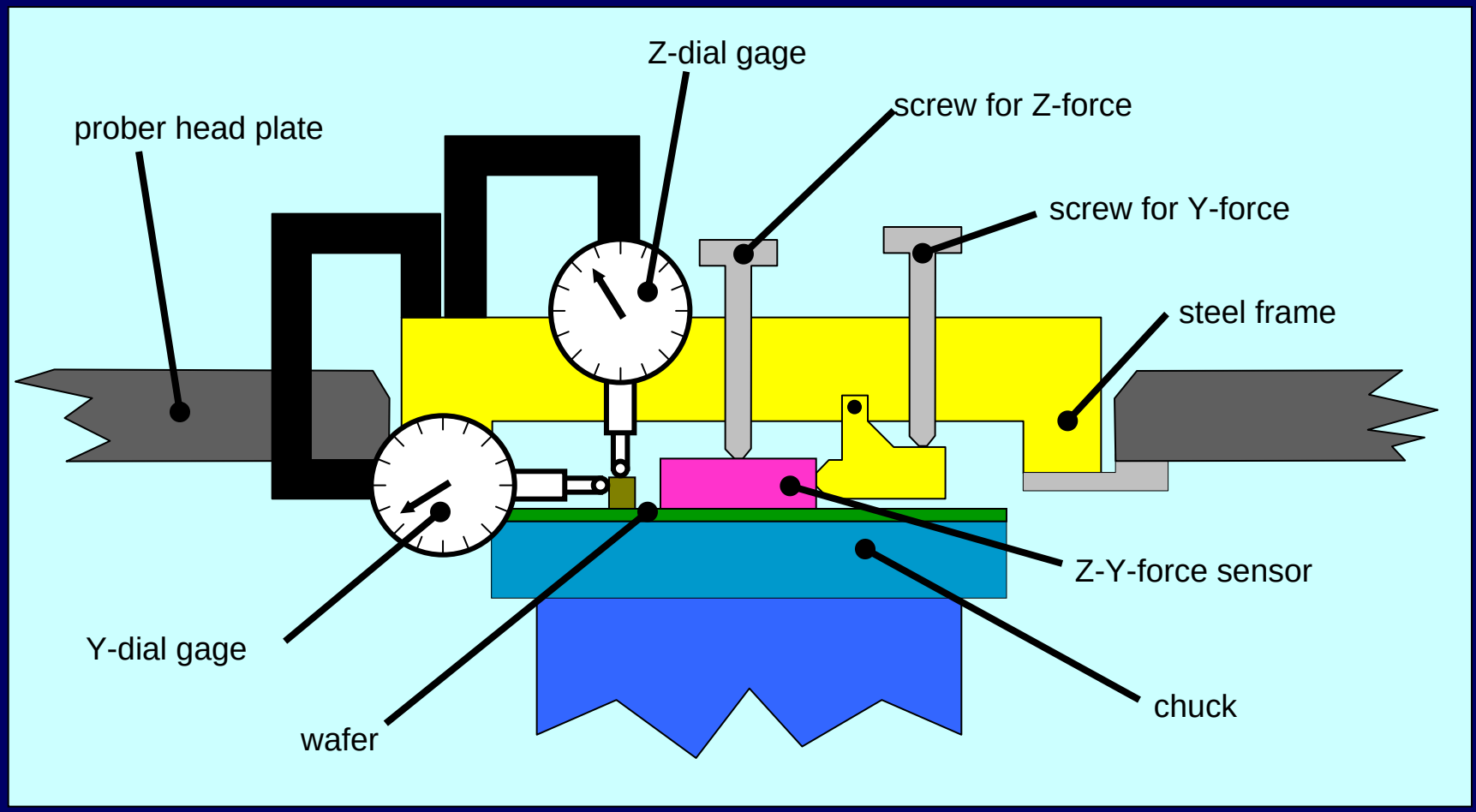
Are todays 300mm prober solid enough for high pincount testing?

- ➔ determine the Z-deflection of a 300mm-prober vs. the Z-load
- ➔ determine the lateral deflection of a 300mm-prober vs. the lateral load
- ➔ generate basic data to optimize the prober setup

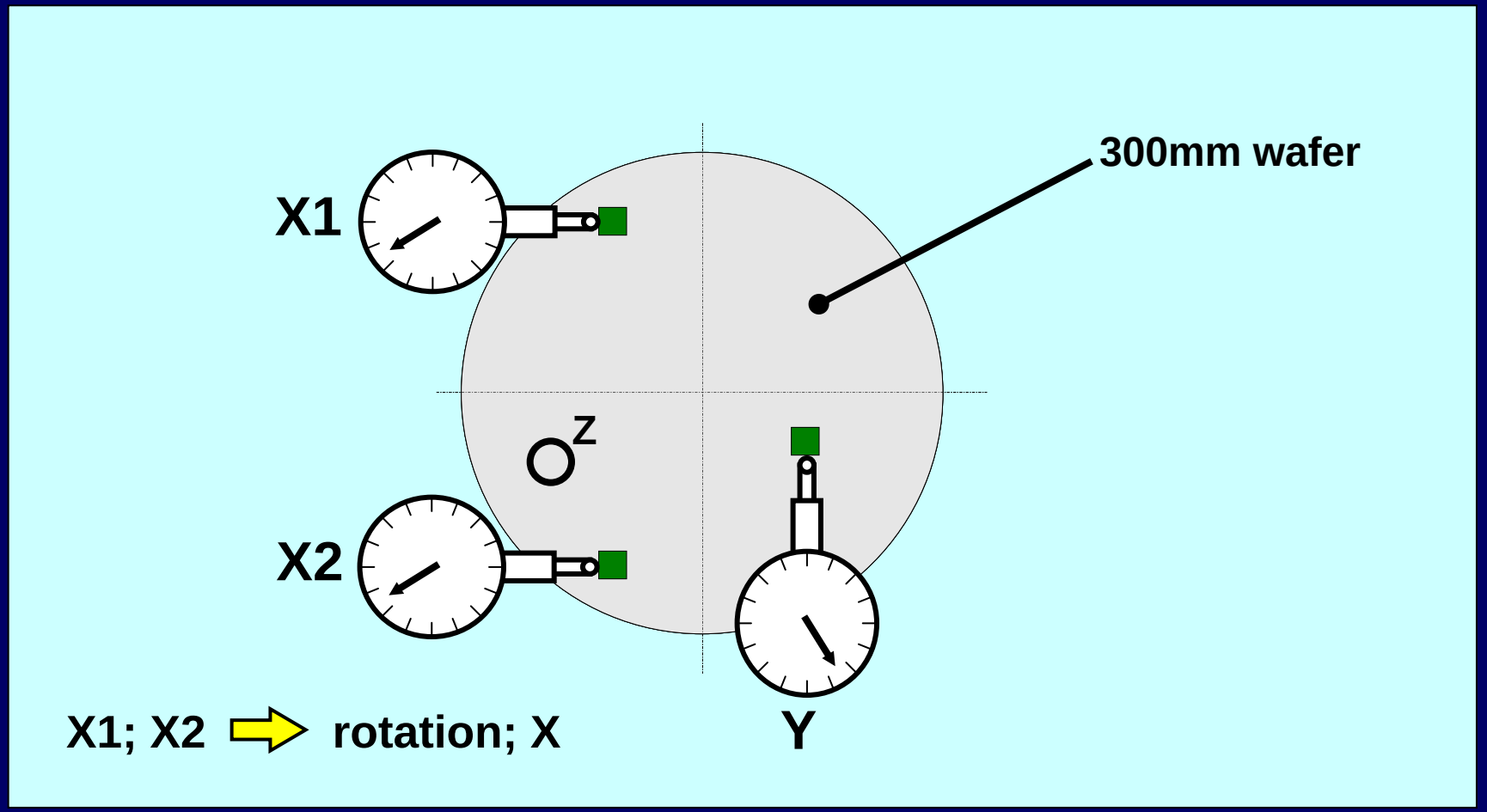
Basic Prober Design



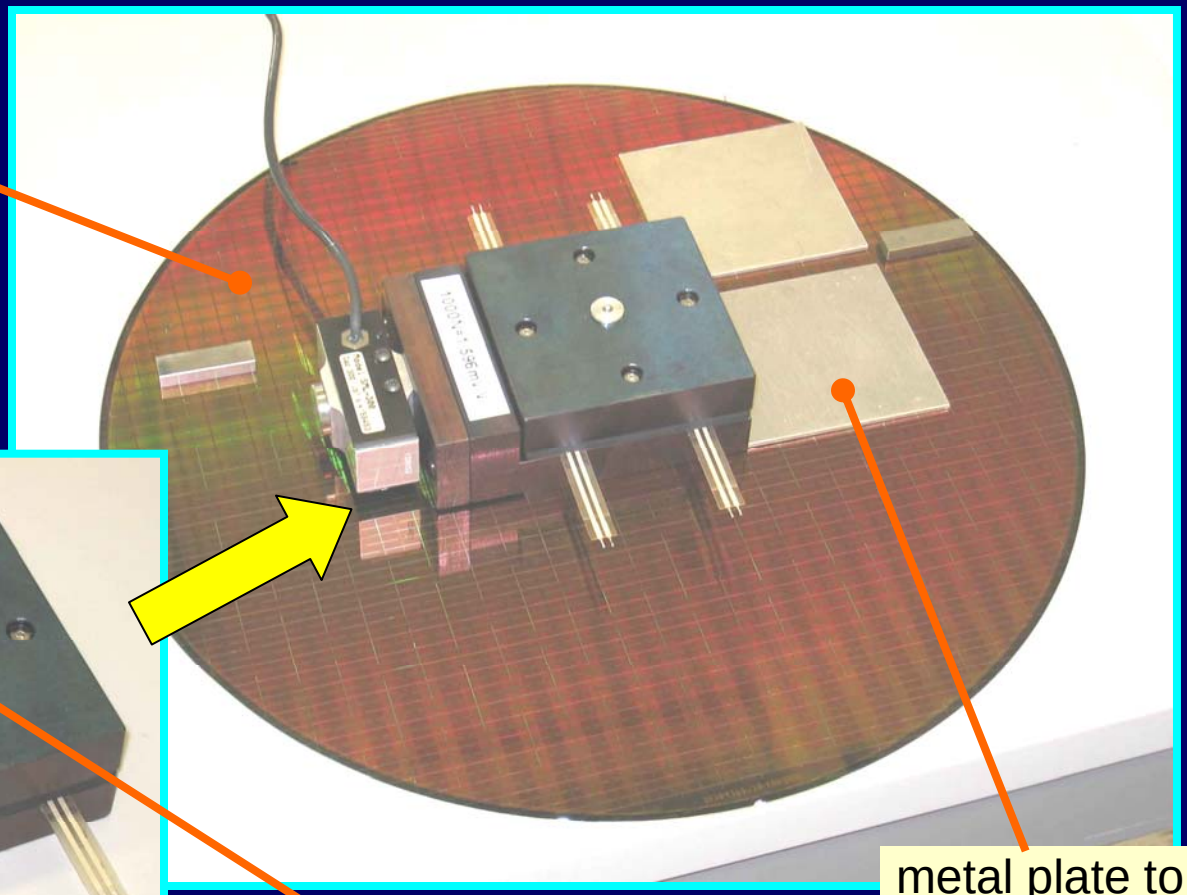
Mechanical Setup of the Experiment



Dial Gage Positions for the Experiment

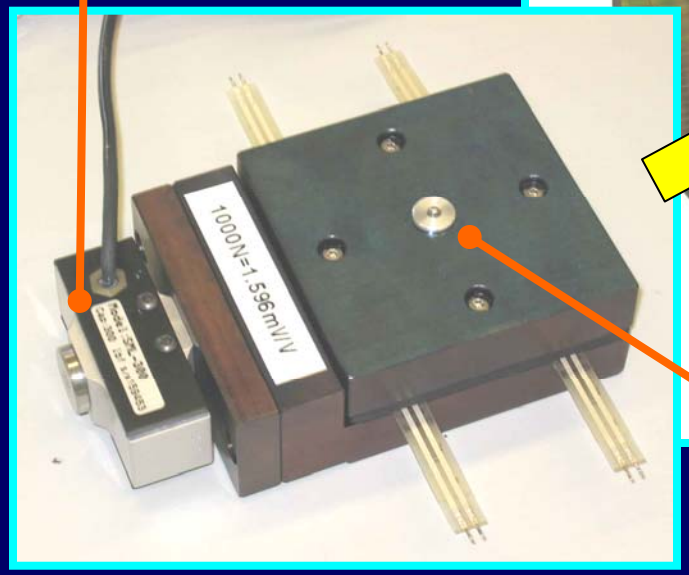


Mechanical Setup: Force Sensor on the Wafer



300mm wafer

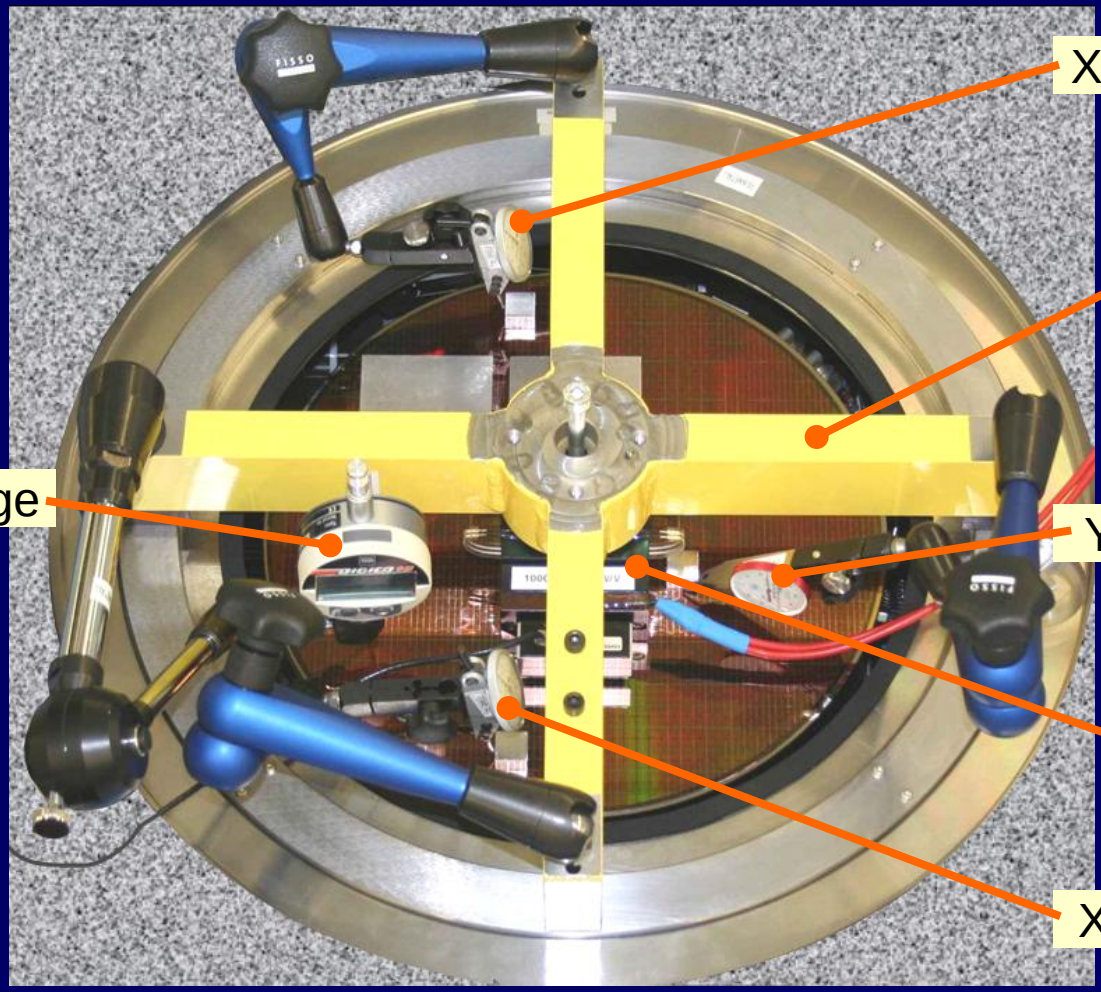
Y-force element



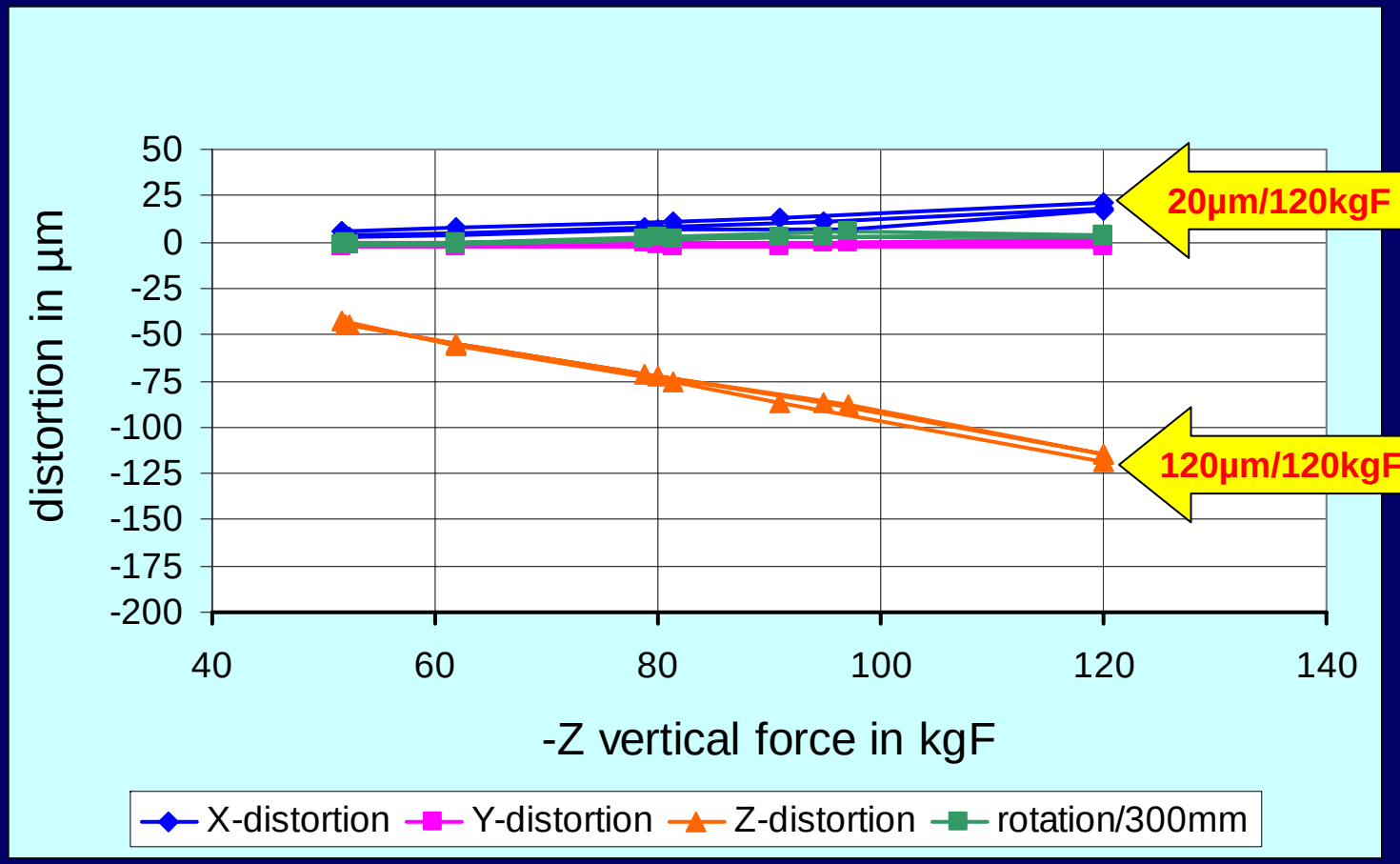
Z-force element

metal plate to hold the sensor

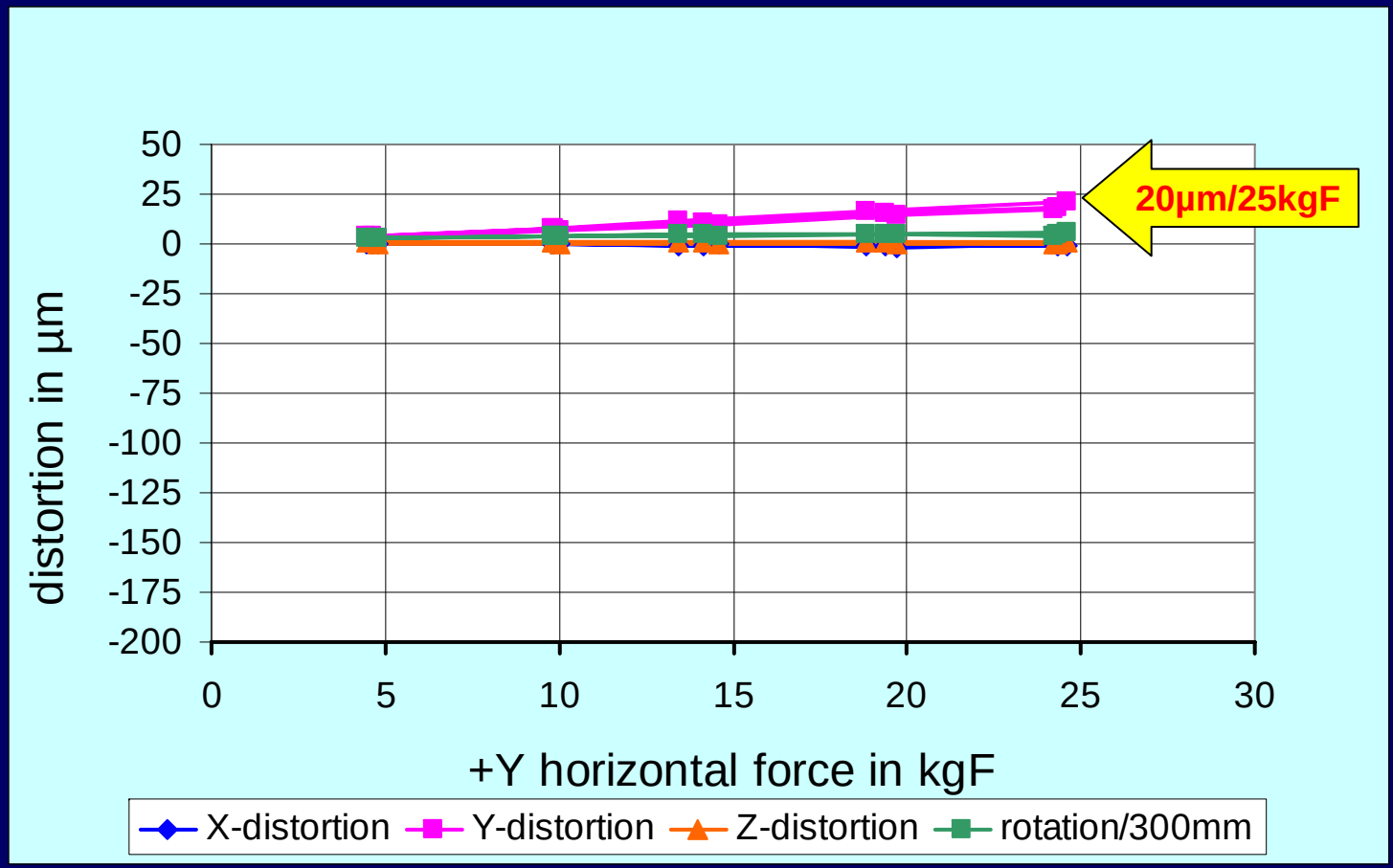
Mechanical Setup: Complete Setup on the Prober



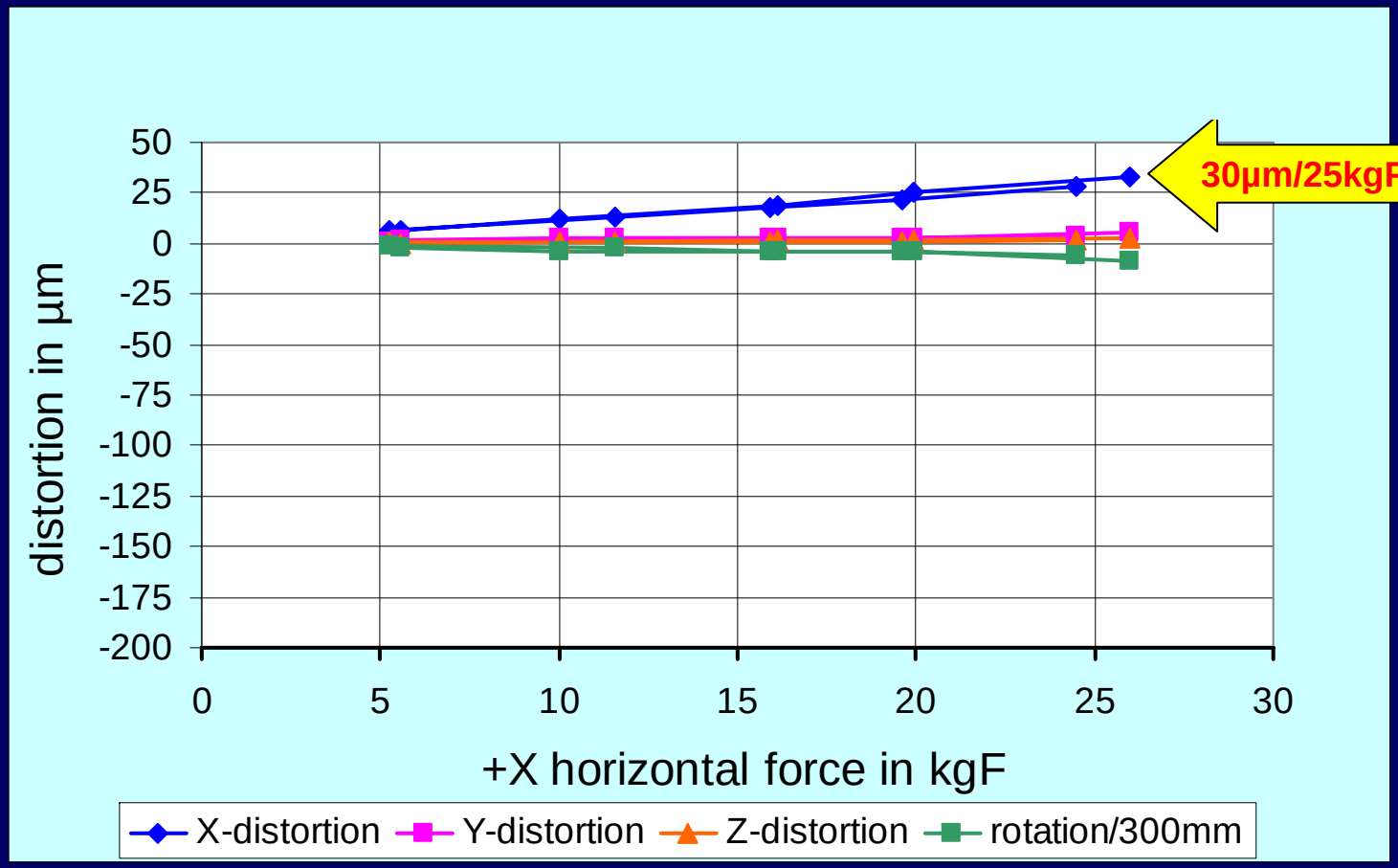
Pure Vertical Z-Force, Centered on the Wafer



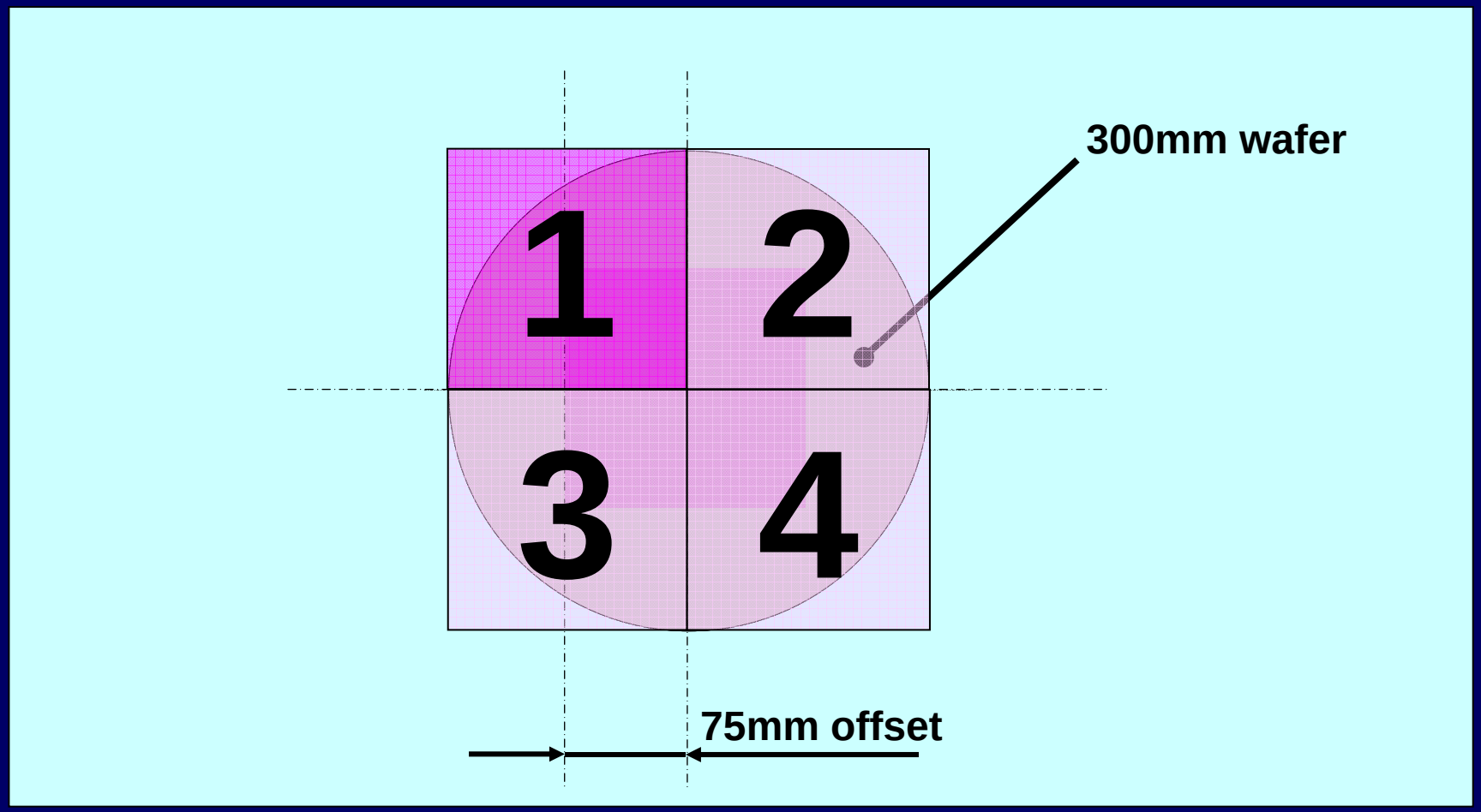
Pure Lateral Y-Force, Centered on the Wafer



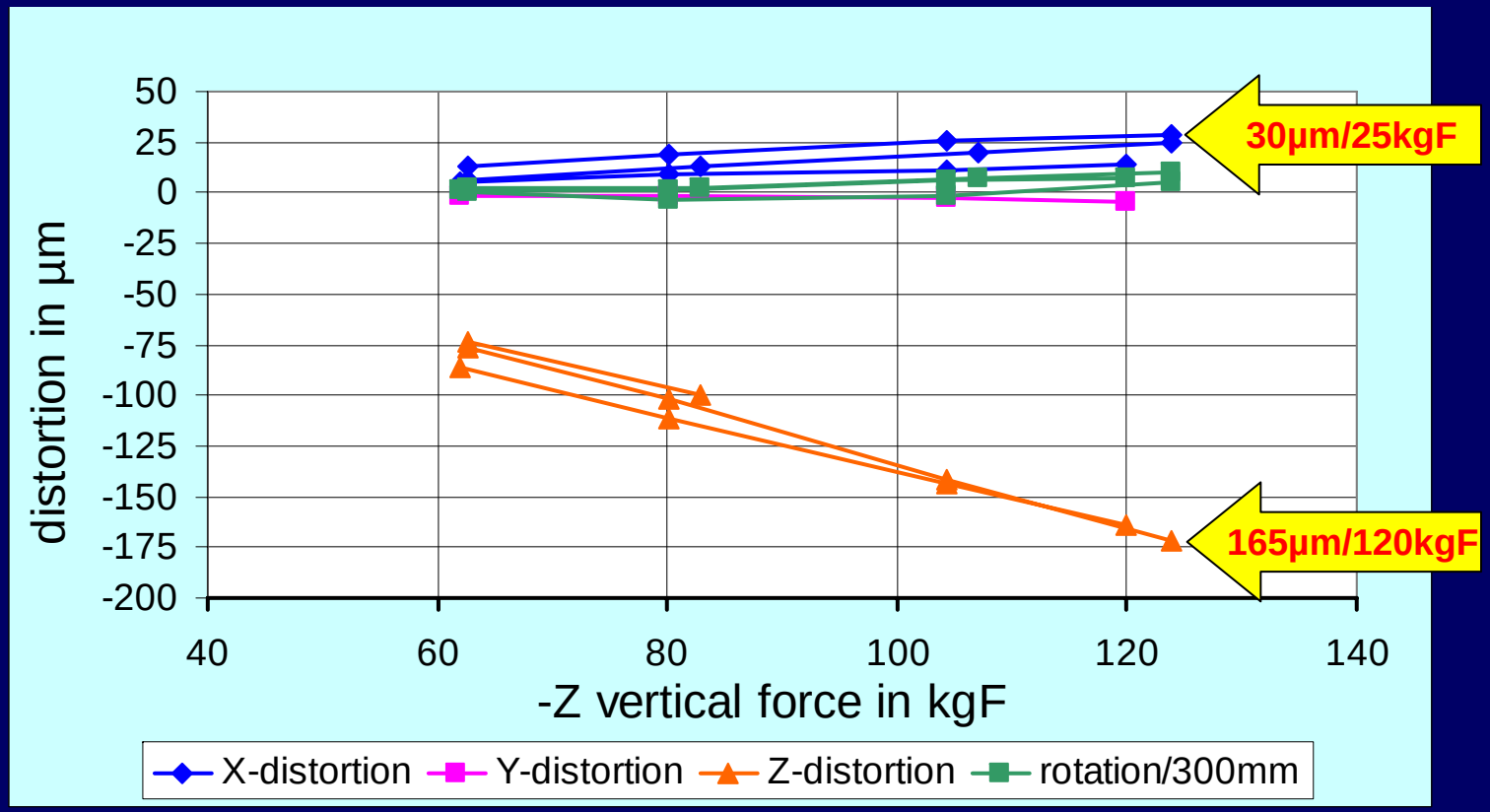
Pure Lateral X-Force, Centered on the Wafer



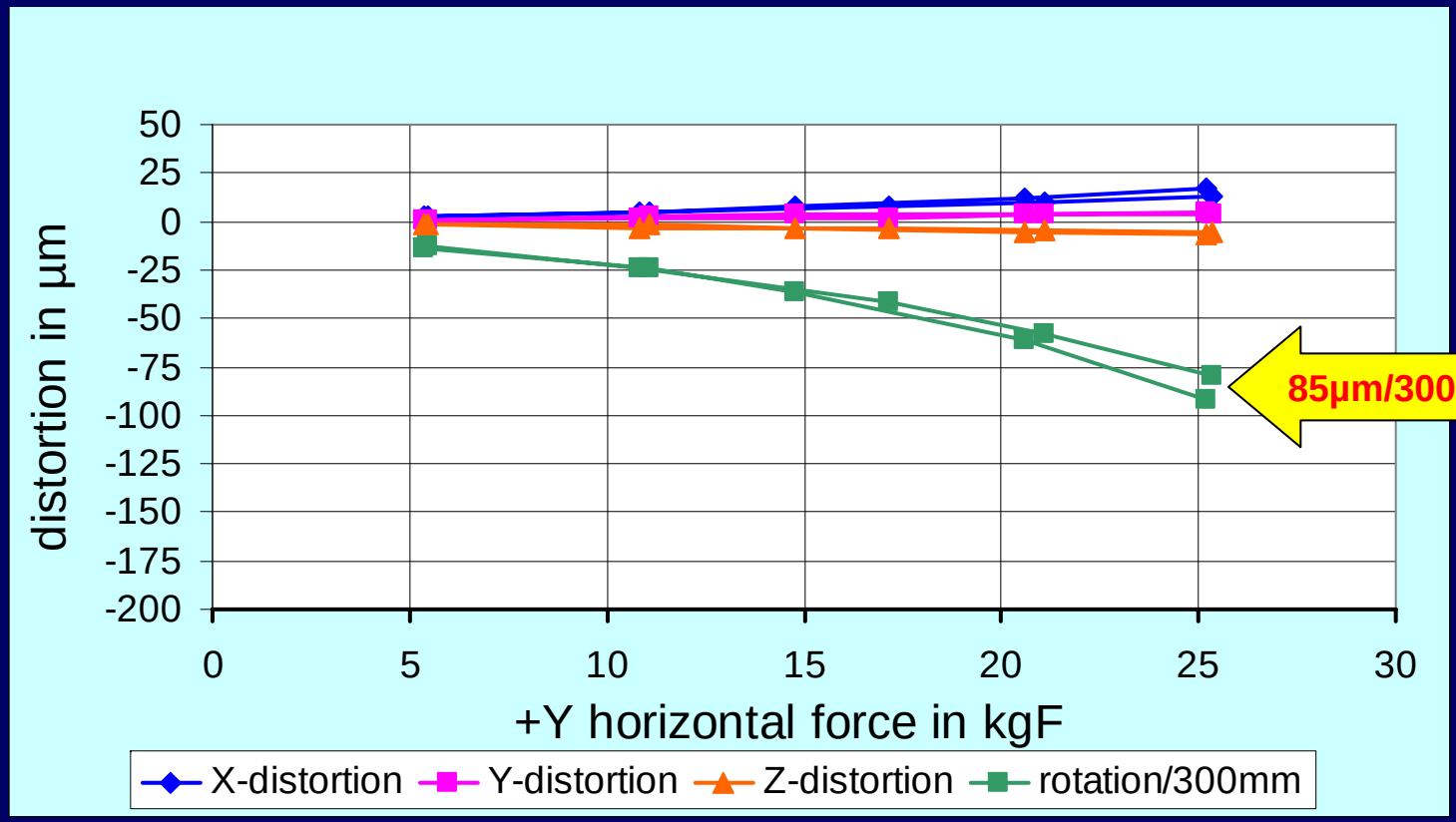
Real Touchdowns are Off Center Touchdowns



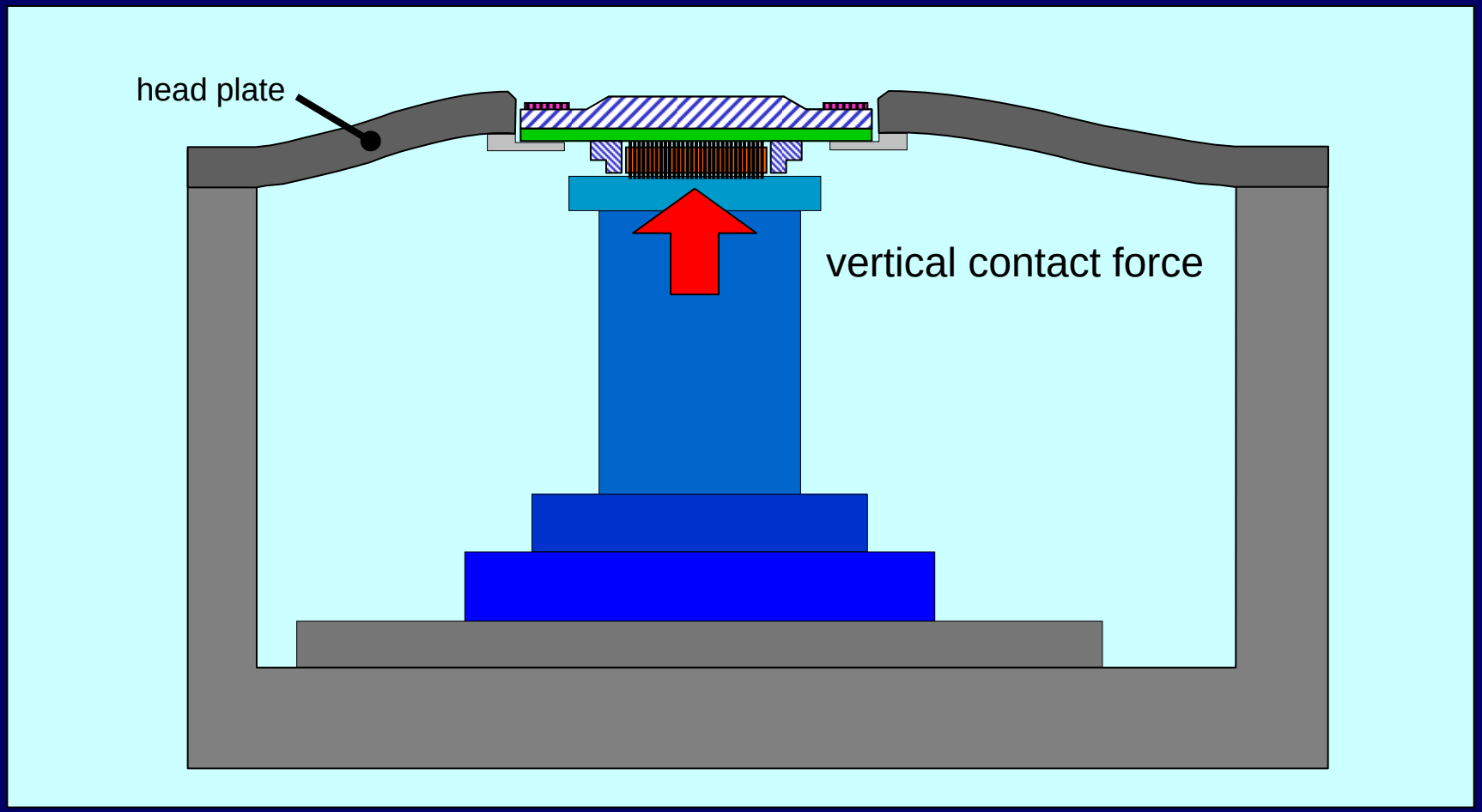
Pure Vertical Z-Force, 75mm Off Center



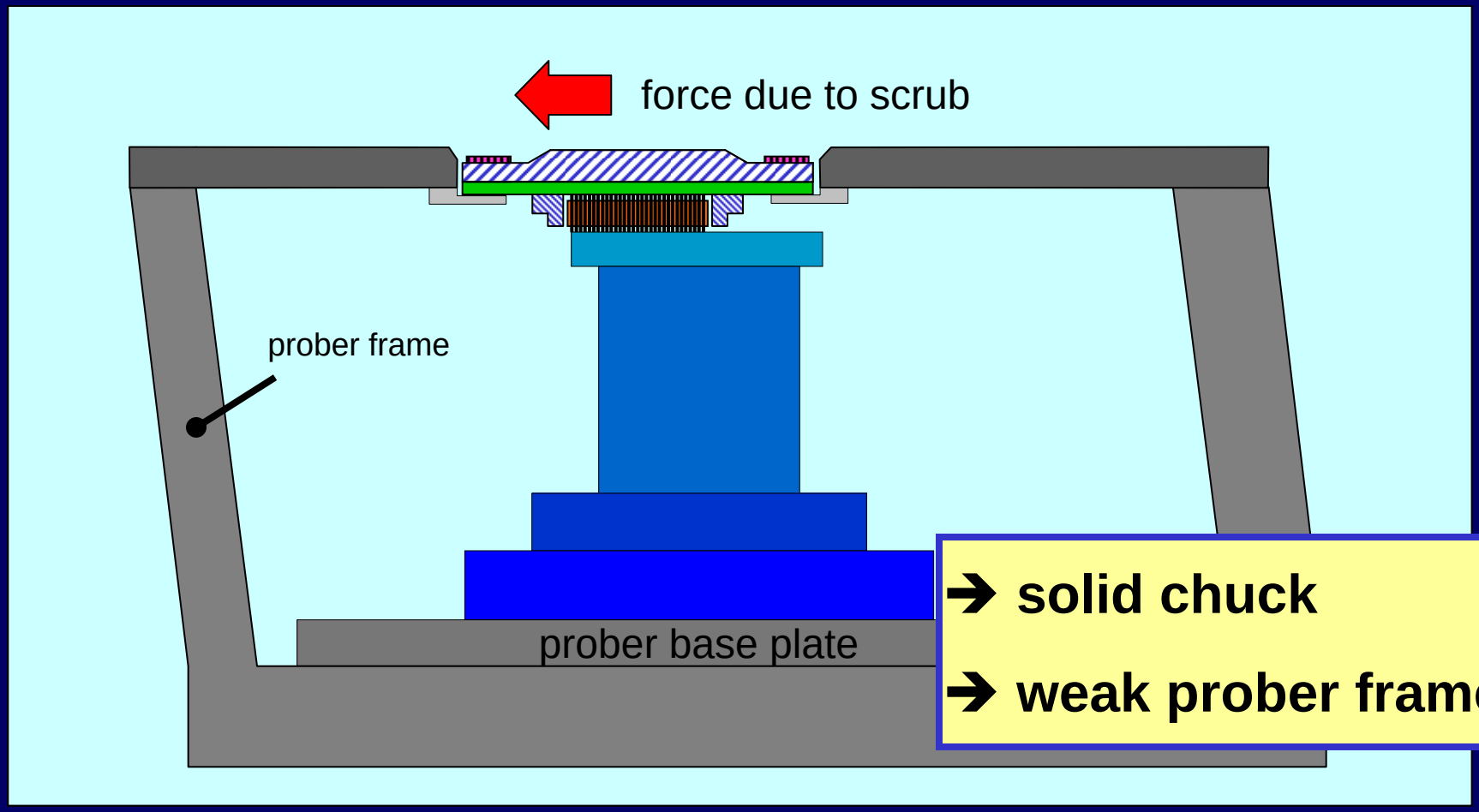
Pure Lateral Y-Force, 75mm Off Center



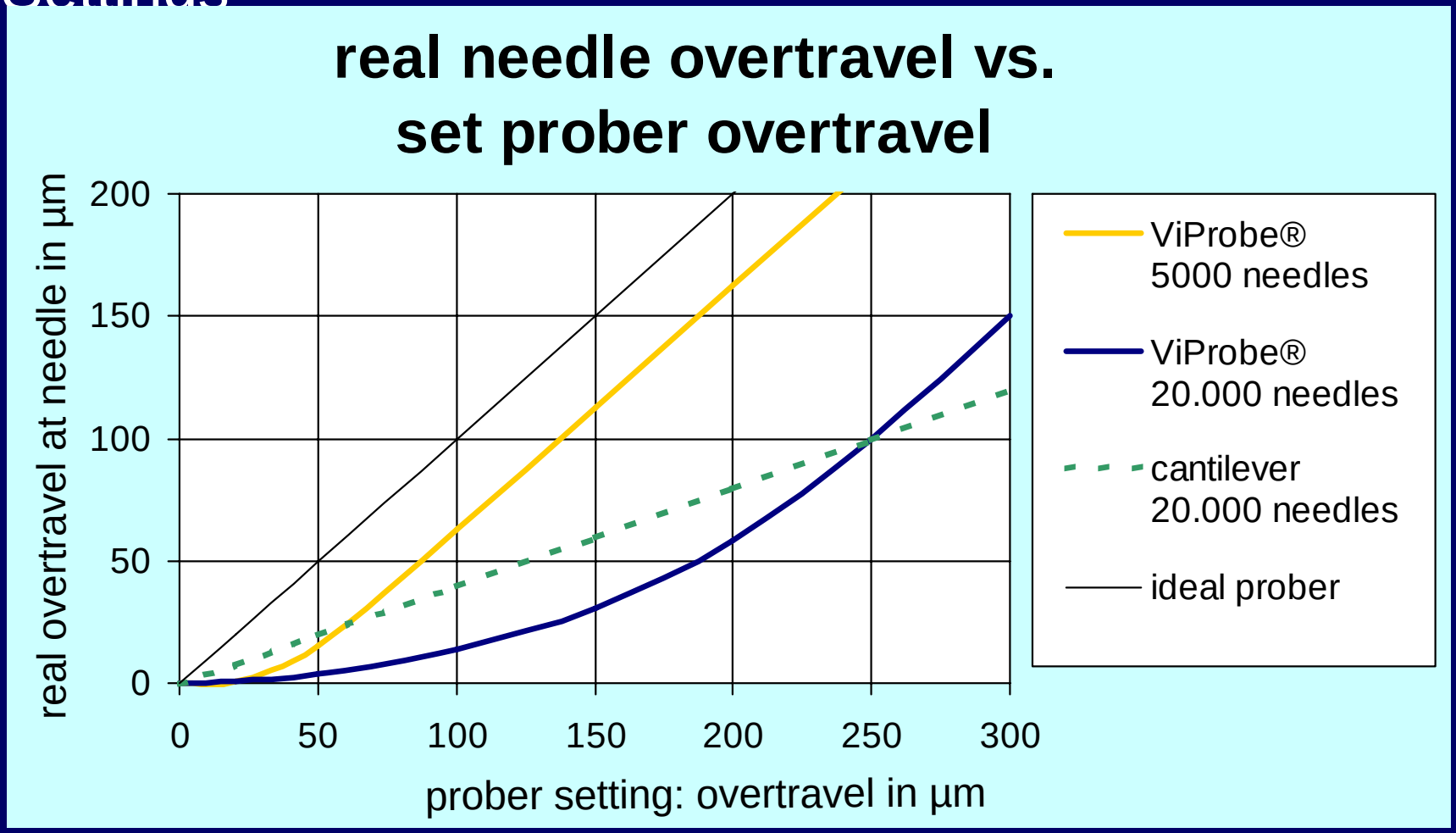
Influence of Z-Force



Influence of Lateral Force



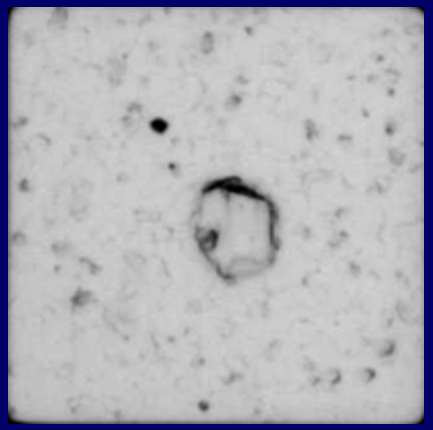
Influence of Prober Deflection to Overtravel Settings



Influence of Prober Deflection to Scrubmarks

common scrubmark

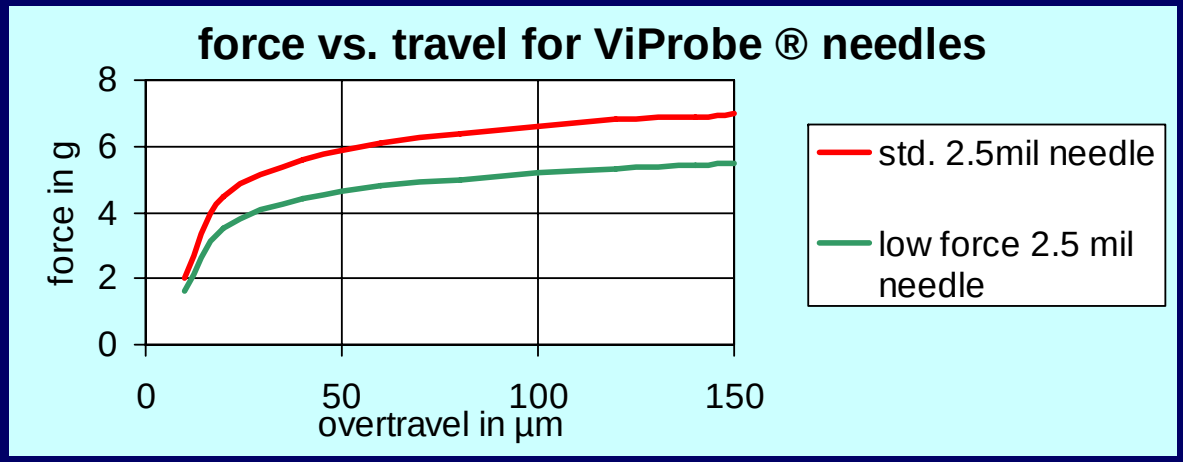
reduced scrublength due to prober deflection



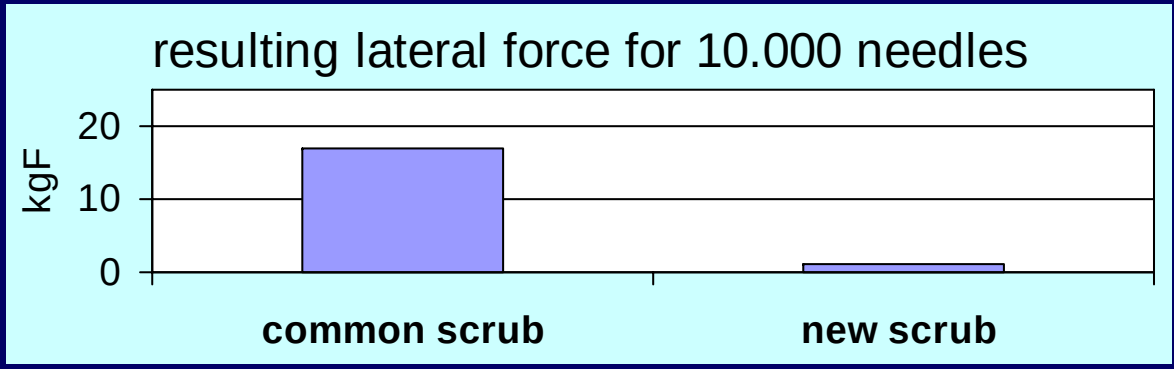
Bad contacts due to mechanically instable prober!

ViProbe® Solutions for the Prober Dilemma

- Introduction of the "**Low Force**" needle for memory applications



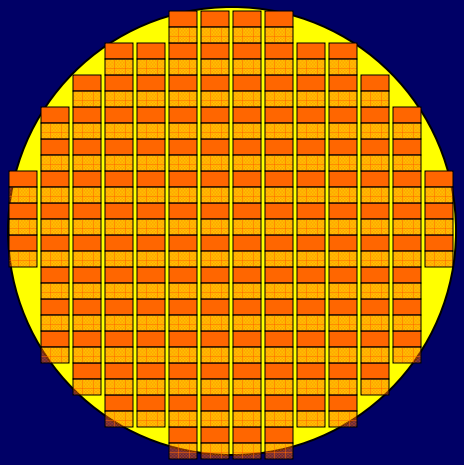
- Introduction of a new scrub mechanism for memory applications

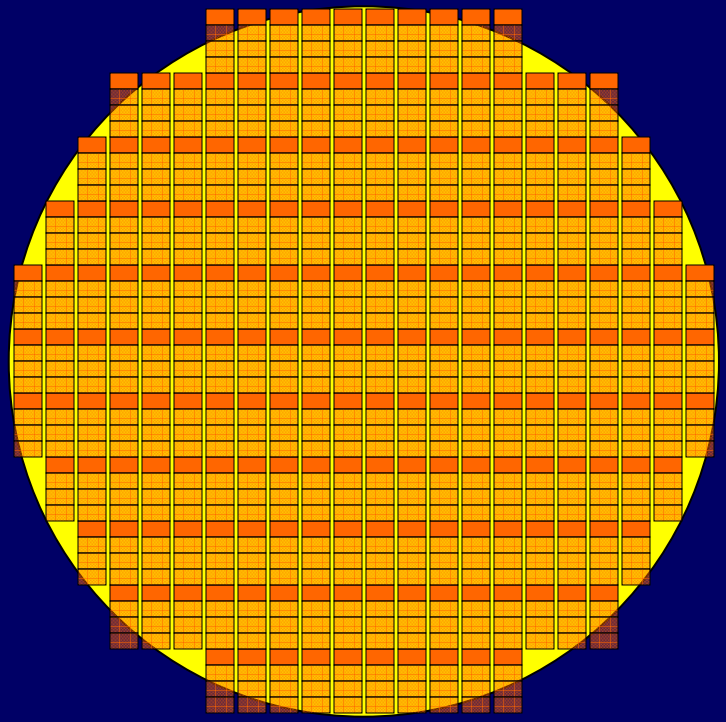


ViProbe® Solutions for the Prober Dilemma

- 300mm 2-4 touchdowns

- 200mm 1-2 touchdowns





Almost centered touchdowns for better prober stability

Can we Proceed as Usual ?

. . . 4-touchdown probecards with 300mm probing area and pincounts above 20.000 will be introduced in 2006

. . . The pincount of such probecards will grow up to 40.000, dependent on the available tester resources and the PWR/GND pincount per device

. . . Reducing the contact force and improving the contact mechanism will improve the situation, but there are physical limitations

. . . Also 150mm and 200mm prober show this type of problems

A fundamental change in the probing strategy
and the prober design is required!

Changes in Probing Strategy

- ➔**Prober Design**: A solid prober frame and a solid prober headplate
- ➔**Controlled Overtravel**: Compensation of the deflection of prober and probecard
- ➔**Force control**: Setting not the overtravel but the contact force instead

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Thank You.

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