



Bump Bonding Status



Christian Kreidl

christian.kreidl@ziti.uni-heidelberg.de

International Workshop on DEPFET

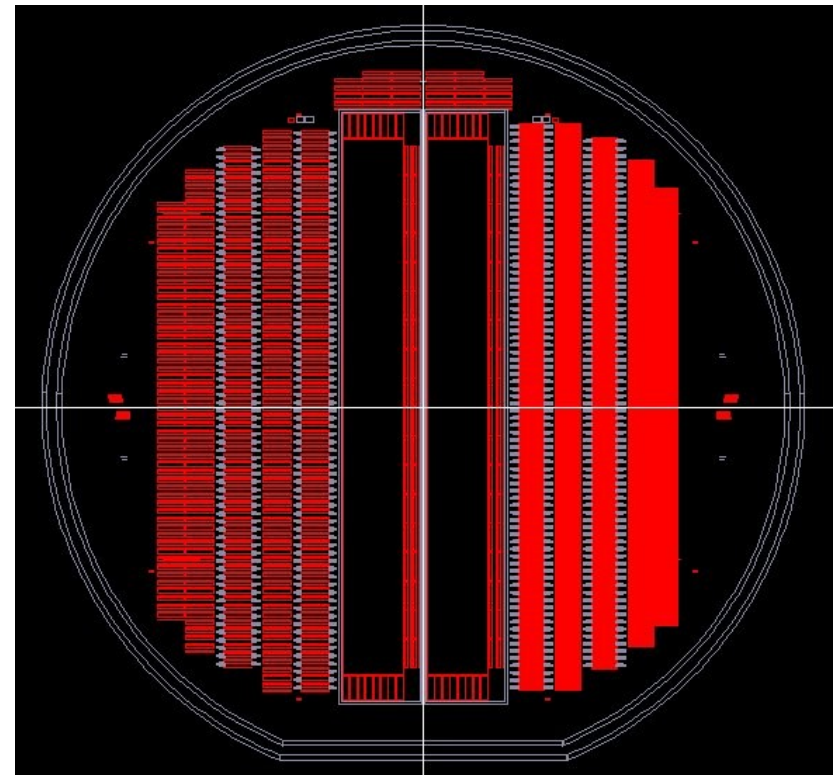
detectors and applications

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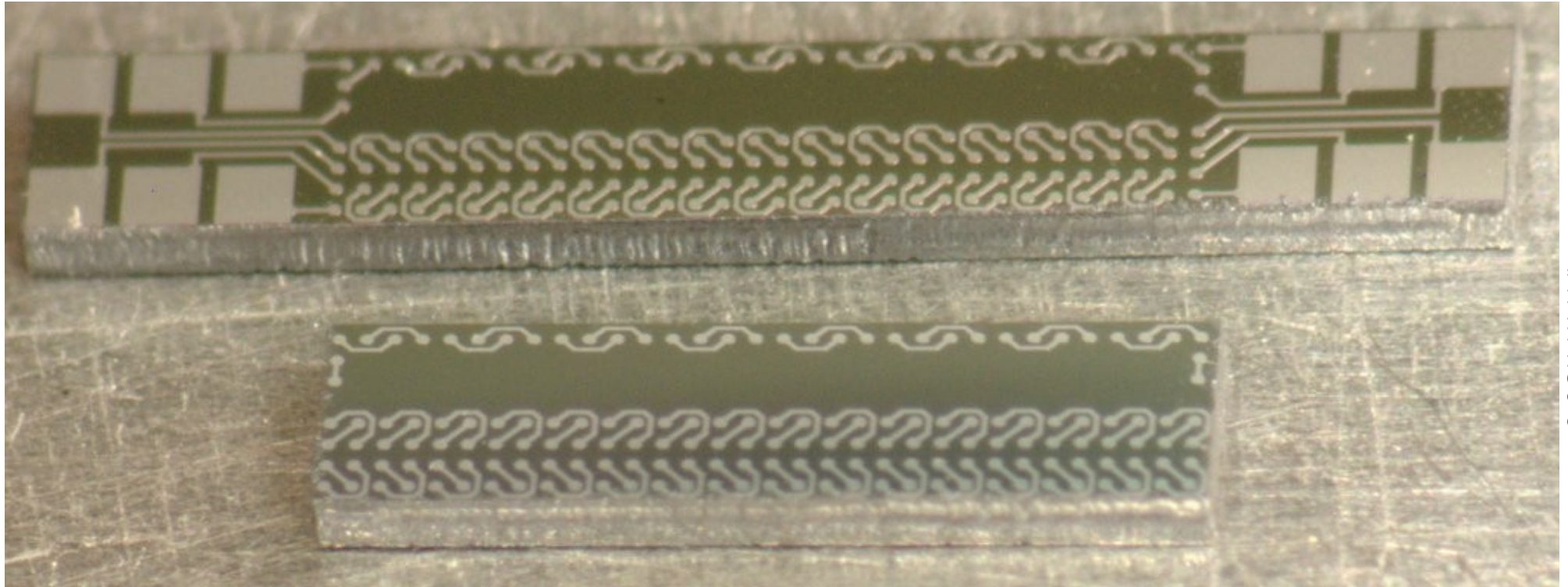
10. - 12.09.2008

Dummy Chips

- several wafers with dummy chips available
- manufactured in HLL, Munich (DEPFET process)
- snake structures for interconnect testing
- 130 full size Switcher3 chip-substrate pairs
- 150 full size DCD pairs
- 2 full size ILC dummy modules
- silicon chips with Al pads
- one metal layer



Switcher3 dummy

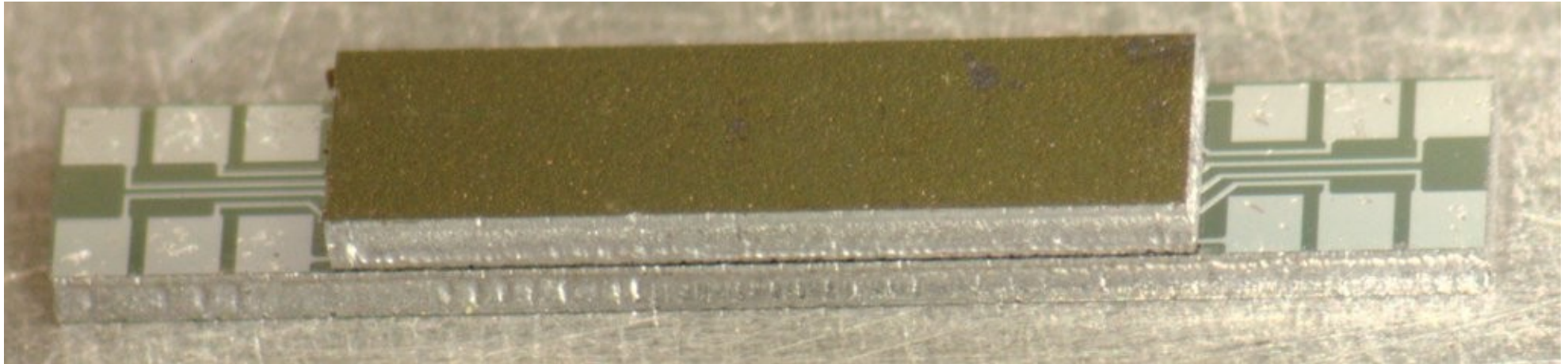


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Switcher3 dummy chip and substrate
164 pads

Dummy Chip Flipping

- flipped Switcher3 and DCD dummies
- 80g/bump: all bumps connected, no shorts
- 20g/bump: 4 of 6 snakes connected, chip fell off
- problem of broken chips is solved
 - non-flat flipchip bondhead was planarized

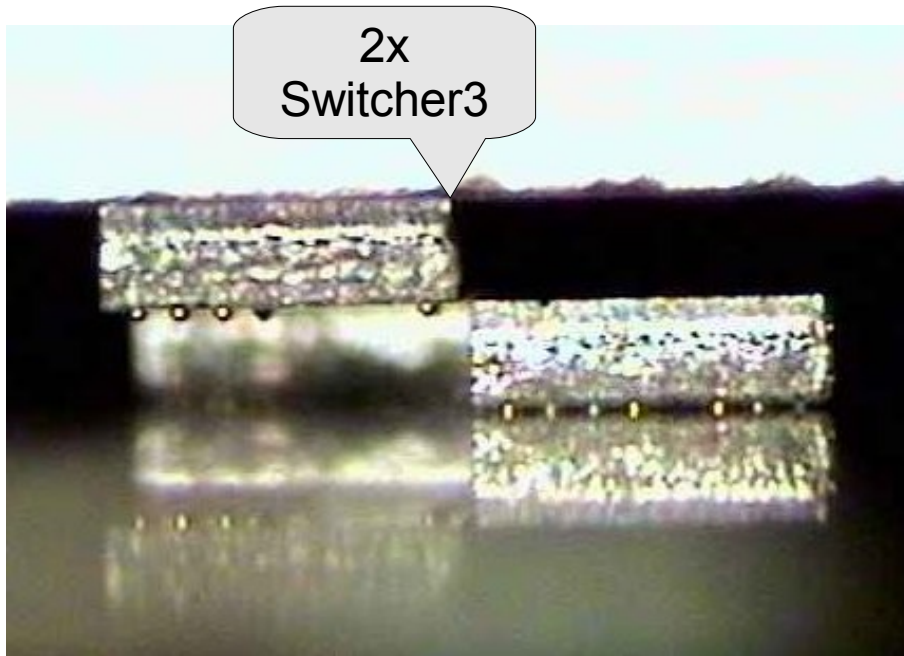


flipped Switcher3 dummy

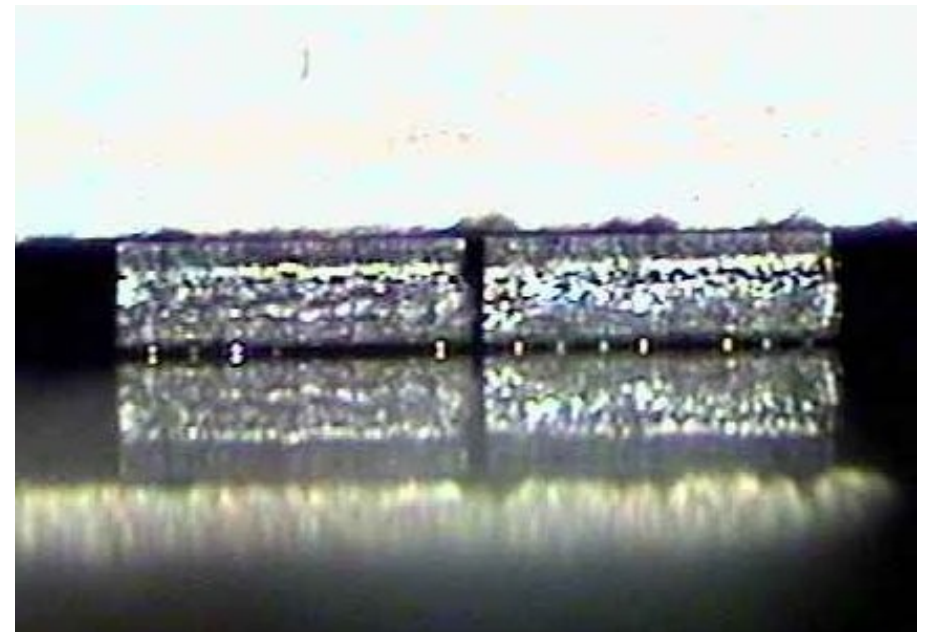
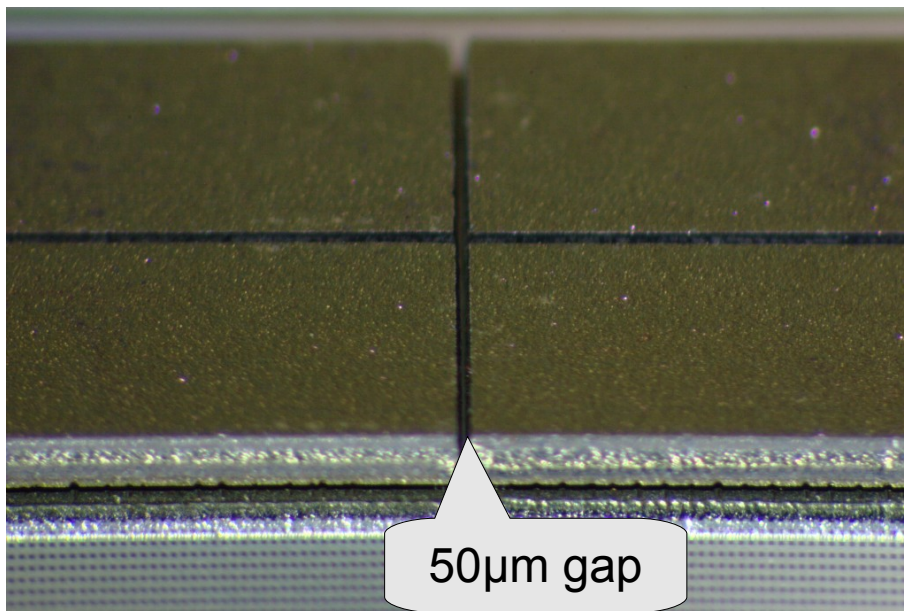
- Mechanical demonstrator
 - no electrical tests
 - check how to handle a large silicon device
 - check how low pitch flipping works
- 16 DCDs
- 36 Switcher3
- 11,9 cm x 1,6 cm



ILC Mechanical Sample

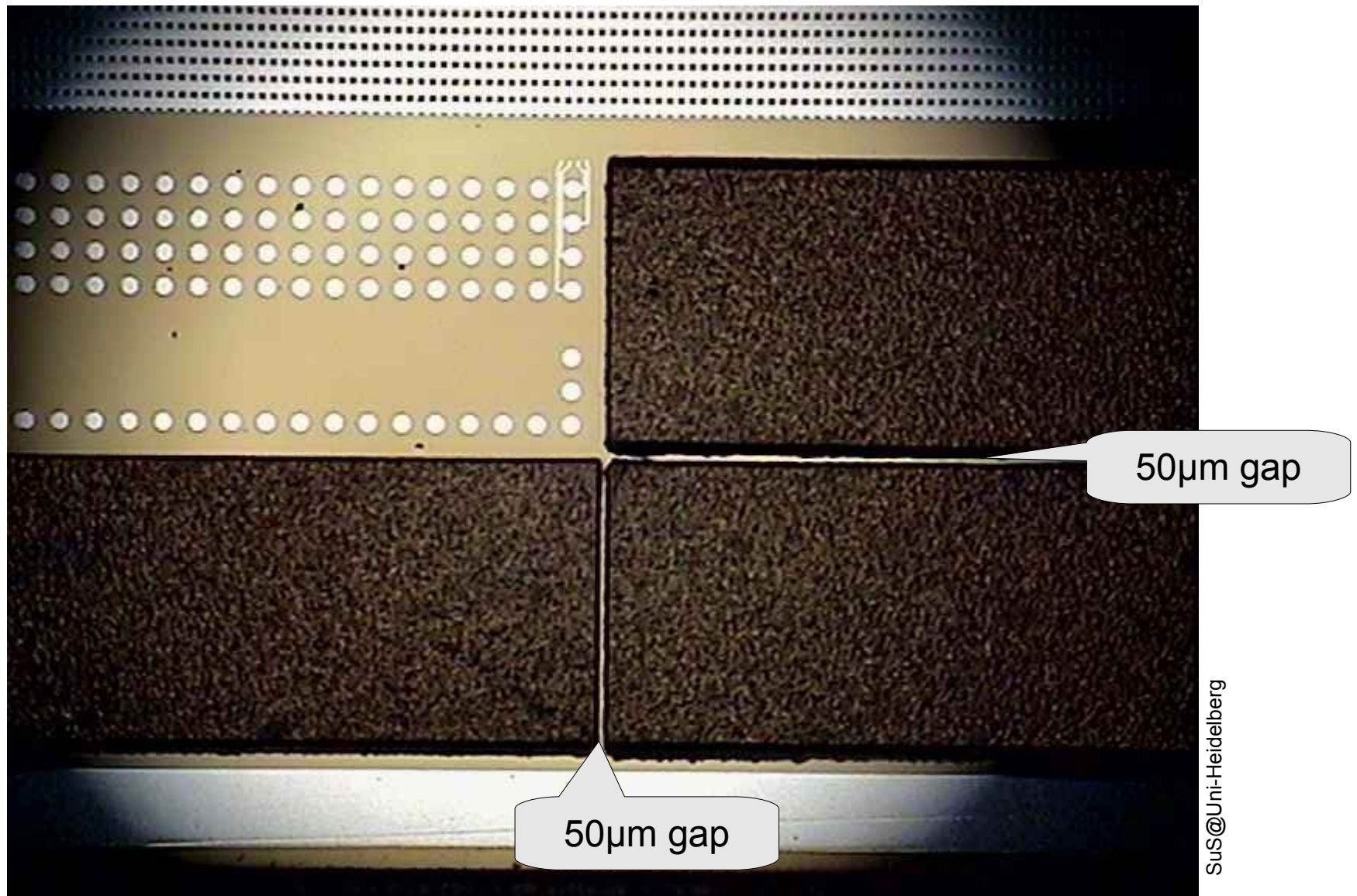


- 36 Switcher3 successfully flipped
- 164 bumps each
- 60g/bump = 9,8kg/chip
- 1,4mm x 5,8mm



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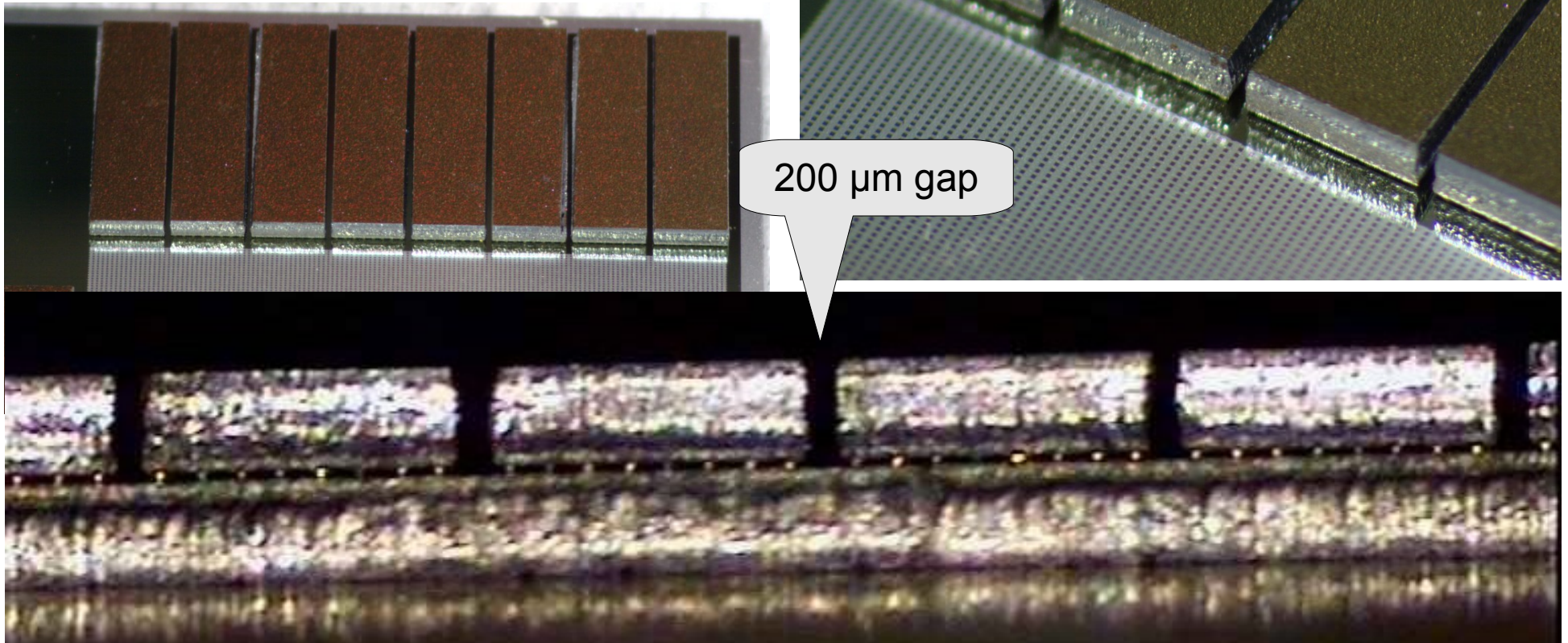
ILC Mechanical Sample



top view of 3 Switcher3 flipped on long edge balcony of ILC module

ILC Mechanical Sample

- 16 DCD successfully flipped
- 224 bumps each
- 1,35mm x 4,95mm
- 60g/bump = 13,4kg/chip



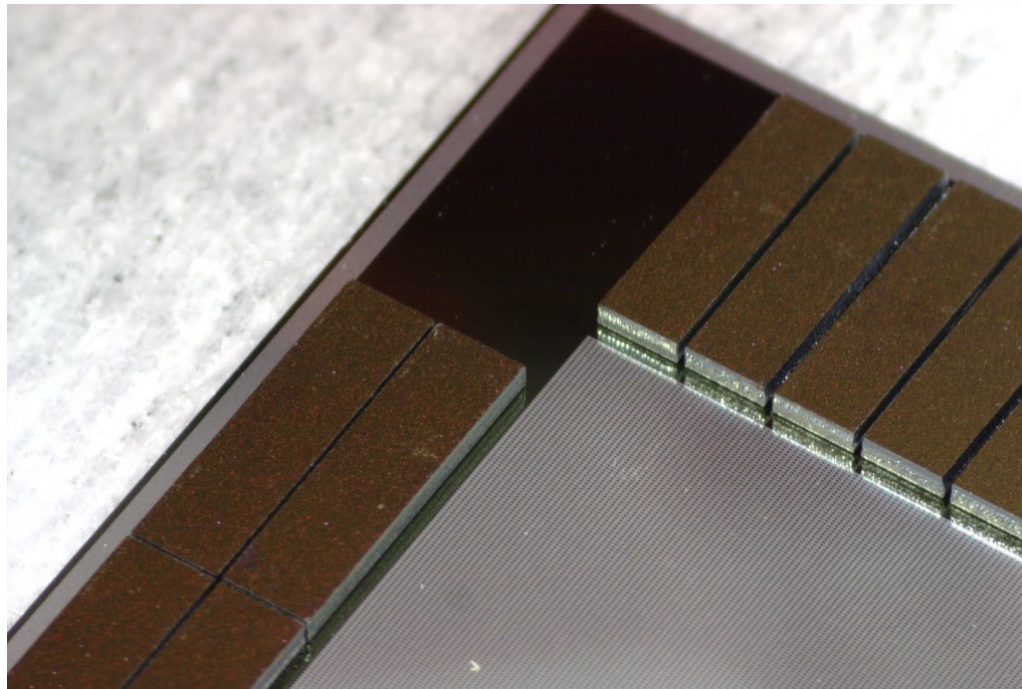
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6 of 8 DCDs on the short balcony of one end of the ILC module

ILC Mechanical Sample



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- Bonding process: cleaning, mounting, aligning, bumping
 - Switcher3: 11min
 - DCD: 13min
- Flipping process: pickup, aligning, thermocompression
 - 9min
- 2 days of work
- todo:
 - build better mounting device for single chip bumping

Thank you!