

Ideas for MPW3 chipboard implementation

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- Keep the functionalities of MPW2
 - AMUX, ABUFF, SFOUT, COMPOUT
 - COMPOUT now called HB
 - Configuration of SFOUT and HB via I2C
 - Configuration of AMUX as in MPW2
 - Use case: S-curves (Threshold scan), beam energies, ...
 - S-curves can be done with digital readout as well
- Implement new functionalities
 - 4 Teststructures for needle measurements
 - 1 as in MPW2, 3 new ones
 - Will be presented later
 - Use case: Cleanroom, IV, CV, eTCT, ...
 - **Digital readout**
 - Source measurements
 - Testbeams

MPW3 as DUT

- Use MPW3 as DUT in a telescope
- Tracking capability
 - Readout rate
 - Track reconstruction
 - Track resolution
- Similar to what we did in Vienna for MPW2 for a single pixel

MPW3 as telescope

- Use 4 MPW3 as telescope
 - Synchronized & triggered together
- Active pixel area $\sim 4 \times 4 \text{mm}^2$
 - Should give $\sim 2.5 \times 2.5 \text{mm}^2$ tracking area in medical beams (scattering in air)
 - Full area available for tracks at CERN, DESY
- ***Goal: Demonstrator of a HV-CMOS telescope***

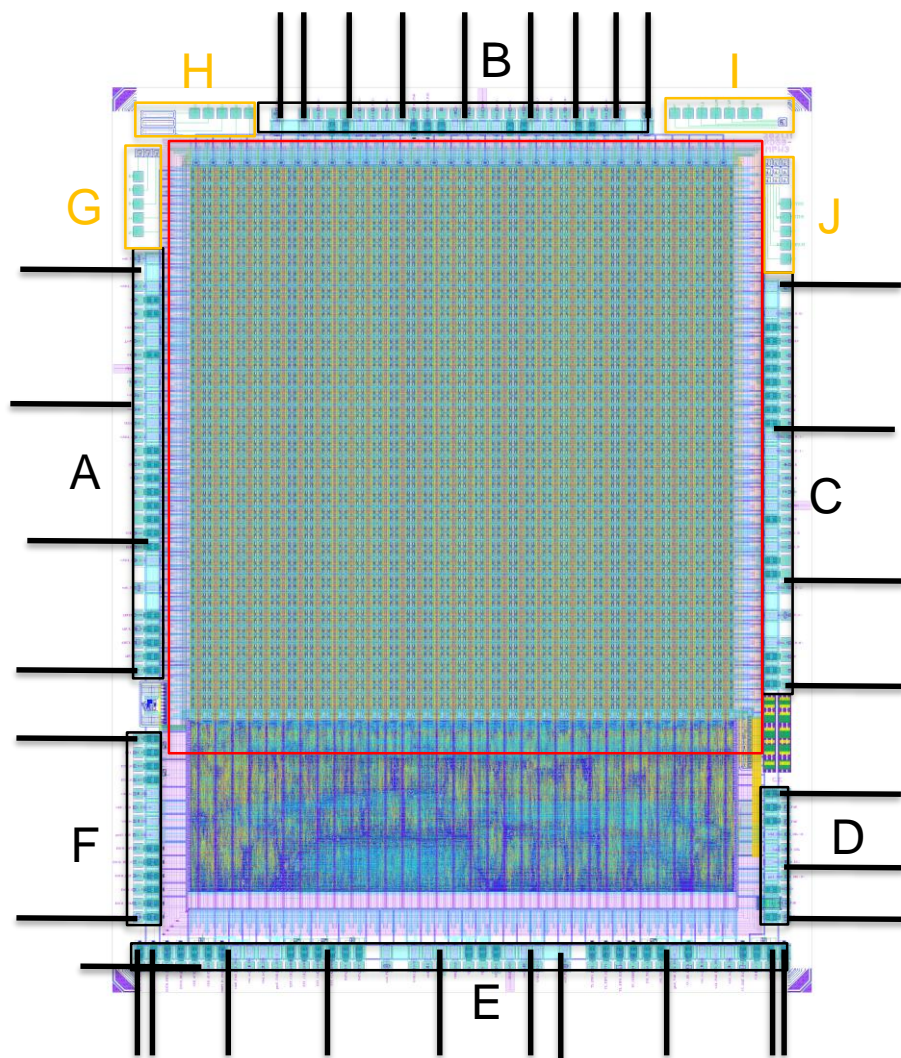
- Having 4 CaR-board + 4 ZYNCS is expensive and difficult to align
- Proposal: Stacked design
 - Chipboard for one MPW3
 - Featuring all functions of the chip, incl. monitoring
 - Connector for an *optional* piggy board with a second MPW3 chip

- Chipboard fully functional also without piggy board
 - To be used similar to MPW2
- Piggy board
 - Reduced, smaller PCB
 - Only important signals connected (less monitoring, ...)
- Spacer of a *few* cm, adjustable
- Flexible Cable of ~10cm
- *We already have a first proposal for the schematic of these 2 PCBs*
- *We want to discuss this after the meeting with everybody interested*
- *We also have ideas for software + started implementing it (Bernhard's talk)*



BACKUP

- Documentation of IO pads (pdf) on indico
- Figures will be available with better resolution soon



- **Need bonding pads on all 4 sides**
- A, B and C are in principle redundant, but we (=the designer) very warmly recommend to bond all sides. (power distribution)
- D, E and F are needed in any case
- **Teststructures (+Pads) G, H, I and J**
 - J is the 3x3 pixel structure (eTCT)
- **Opening below pixel matrix (material budget)**



Additional connector to attach piggy board with 2nd chip. This connector is also used to probe signals in single chip operation

SAMTEC connector → Carboard