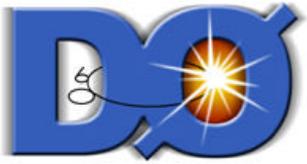


Readout issues

Andrei Nomerotski, L0 workshop 9/25/2003

- Chip
- Hybrids
- Logistics of mixed readout
- Other thoughts



SVX2

- **Pros**

- ◆ Same chip as all others
- ◆ Use Run2a Adapter Card
- ◆ Have enough chips for L0

- **Cons**

- ◆ Known chip problems
- ◆ Need to design hybrid & long low mass cable
- ◆ Chips not tested, need probe card, test setup
- ◆ Few experts, few readout teststands around

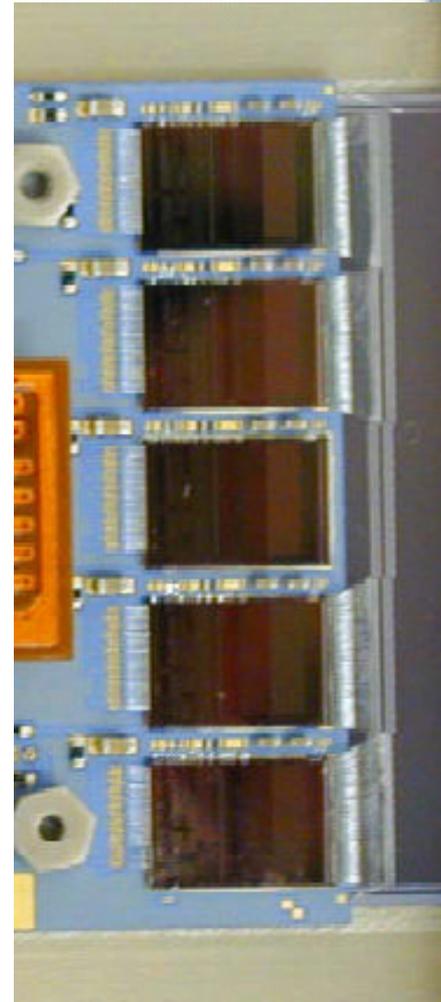
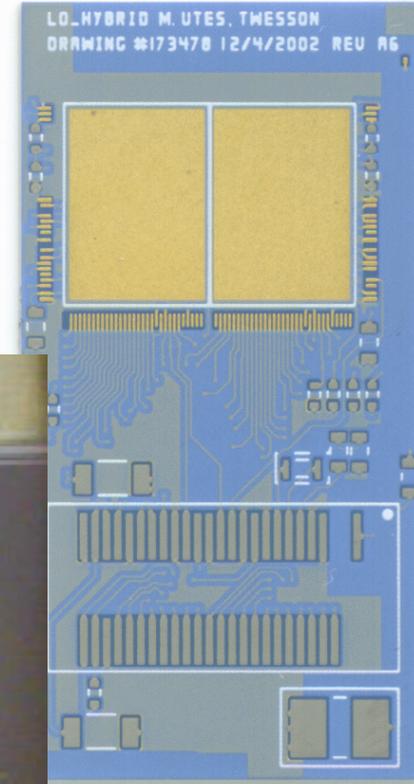


SVX4

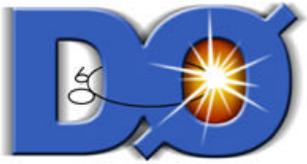
- Pros
 - ◆ Better chip
 - ◊ No known bugs
 - ◊ Dynamic pedestal subtraction
 - ◆ Have enough chips, testing up to speed
 - ◆ Full readout chain prototyped and can be used as is
 - ◆ Burn-in and 1% stand up to speed
 - ◆ So far a lot of experts around, also bonus for people who worked on it last 3 years
- Cons
 - ◆ Active Adapter Card
 - ◆ SVX4 readout needs to coexist with SVX2 readout
- What about hybrid? Next slide
- To me there is little doubt that we should use SVX4



Hybrids

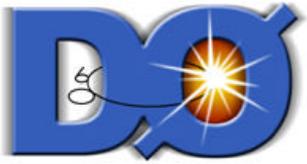


- Disclaimer : Hybrid is intimately related to mechanical design - normally things are more constrained than it looks in the beginning
- Can we use 2 chip hybrids as is?
 - ◆ May be for analog cable design
 - ◆ Some mods needed for on-board design - look straightforward
- 1-chip hybrid will be a major redesign and most likely R&D
 - ◆ New connector (or soldering?)
 - ◆ Do we need smaller feature size? => new printing techniques
 - ◆ One round of prototyping ~ 6 months
- Double-ended 2-chip hybrid (= 4 chips per hybrid) is easier but still a major redesign
- All the above can be done - it's a question of schedule and effort



Logistics of mixed Readout

- Removing H-disks frees up 192 channels - enough for any scenario
- All H-disks are mapped together to $(2+4) \times 4 = 24$ Interface Boards
 - ◆ All 8 IB channels are cabled
- => No mix of SVX2 and SVX4 in SEQ (good!)
- SEQC will need to operate simultaneously with SVX2 and SVX4 chips - important! (not good)
 - ◆ SVX2 SEQC firmware will work with SVX4 (checked)
 - ◆ Opposite is not true
 - ◆ Discussed with M.Utes testing of mixed system - can be checked quickly
- VRB - no difference



LV & HV thoughts

- LV

- ◆ New AC

- ◆ Receives 3 voltages via 80-conductor cable using the same lines as old AC
- ◆ Has voltage regulation

- ◆ Currents are small

- ◆ => can use the same AVDD, AVDD2, DVDD for SVX4 and new AC - no mods are needed

- ◆ Needs careful verification (voltage distribution & currents)

- HV

- ◆ If HV expectations are below 300 V can use the same HV path as for H disks - no mods are needed



Other thoughts

- Smaller number of channels would be much easier to handle
 - ◆ Problem : present system occupies pretty much all available space
 - ◆ For example if in total have 36 channels
 - Can be mapped to 1/2 SEQC per quadrant
 - New ACs can fit into existing x-ring on the HorseShoe (?)
 - ◆ Easier commissioning

Bottom line

- Readout should be based on SVX4
- SVX4 readout can coexist with SVX2 readout