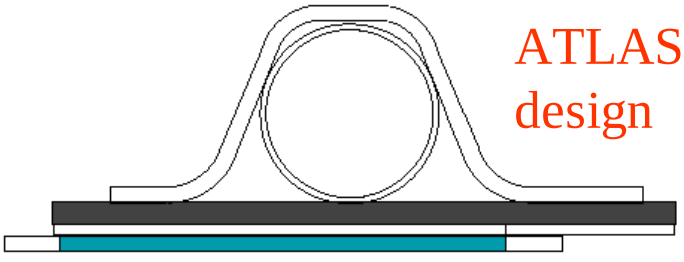
Pixels for CDFII in Run IIb

1. Overview
2. PAC Presentation
3. Recent progress
    1. Mechanics
    2. Electronics
    3. DAQ (Sergio)
    4. Physics Simulation (Any?)
4. Forward physics proposal (Mike Albrow)
5. Future Plans

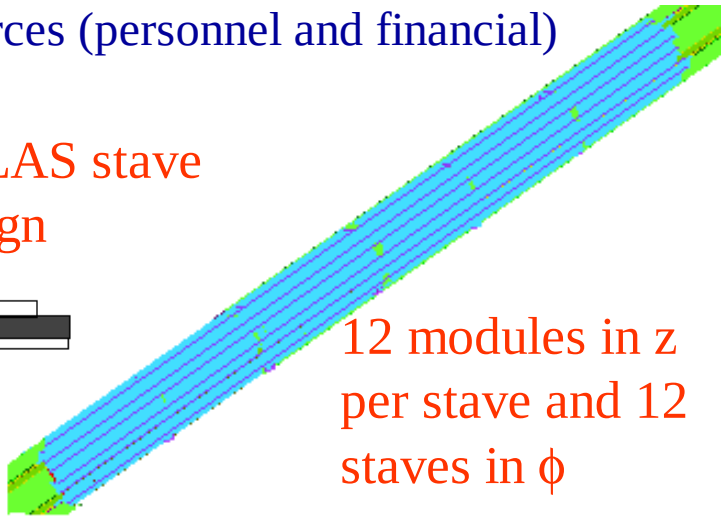
This is an informal meeting but the pixel project is starting. We plan to start in earnest early next year.

Overview

- Replace Layer00 strips with pixels
  - radiation survivability to 30 Mrad / 30 fb-1 is desirable
  - pattern recognition: 3.3 M channels vs 14 K channels
  - z resolution 60-120 μm possible
  - large S:N helps r-ϕ resolution, trigger, etc.
  - keep Layer00 strip option a fallback
- Pixels can be ready for 2004
  - ATLAS-style sensors in production
  - FPIX readout chip in advanced prototype
  - cost and schedule fits into RunIIb plans
- Overlap with BTeV and D0
  - BTeV 10% scale test is comparable
  - Economy of scale (preproduction/production quantities)
  - Initial sharing of resources (personnel and financial)



ATLAS stave design



12 modules in z per stave and 12 staves in ϕ

PAC Presentation

- Run 2b silicon working group
  - Report to CDF review committee
  - Report to PAC
  - Presentation by Michael Schmidt to the PAC on behalf of the review committee
- See CDF Note 5425 and

http://www-cdf.fnal.gov/run2b/Run2b_silicon.html

- PAC comments:

The possibility of using pixels in the innermost layer is an intriguing option mentioned by both collaborations. The Committee urges them to work closely with the Fermilab pixel group, building on the success of this R&D program.

FY01 Requests

- Mechanical
  - ENGINEERING SUPPORT
  - System level mock-up
  - Prototype stave
  - Cooling test
- Electronics
  - ENGINEERING SUPPORT
  - DAQ test stand
  - Progress with RHVD R&D

Item	Estimated Cost k$	Contingency	Total Costs
DAQ Test stand	15	7.5	22.5
System Mechanics	20	10	30
Staves prototypes	20	10	30
Cooling	15	7.5	22.5
Total M&S	70	35	105
Mech. Engineering (FTE)	1.0	0.5	1.5
ESE	0.5	0.25	0.75
Design	1.0	0.5	1.5
Technician	1.0	0.5	1.5

Mechanical Progress

- ATLAS style stave design
  - Very good baseline concept
  - Need lead engineer input
- Renewed discussions with Mike Hyrcyk and Giobatta Lanfranco
  - CDF work is finishing
  - SiDet is reorganizing
  - Project isn't fully approved
- Contact made with ATLAS project engineers
  - CERN visit in mid-January
  - Future visit to LBNL
- Miscellaneous
  - G10 for module mechanical mock-up
  - Discussion with Harry Carter on beampipes

Electrical Progress

- FPIX chip
  - Pre-FPIX2-T2 in hand
  - Gate rupture radiation testing
  - FPIX1 wafer scale testing
  - Initial meetings on FPIX2 finalization for the periphery
- Sensors
  - Discussion with Sally Seidel
  - Unbricked or bricked
    - For bricked design, we would need a prototype submission and testbeam
  - Possible engineering available in January for sensor layout

Future Plans

- Pixel project has started (at least no one yet has said “no!”)
- For the next 10 months or so
  - Keep early FY02 order for sensors and chips
  - Make progress on mechanical and cooling engineering
  - Make progress on DAQ design
- Institutions should start thinking about their preferred areas
- Lots of discussion and communication will start (propose monthly meetings)