Status of Anode Electronics

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Outline:

I. T. Ferguson – general status and plans.
II. Kolya Bondar – ASIC and Front-end Board.
III. Sasha Golyash – ASIC test stand.

ASIC

Important to remember that all anode results so far have been done with our FIRST 16-channel chip submission.

Latest chip submission: Nov. 18, 1998.

Chips finally shipped: Feb. 19, 1999 (13.2 weeks after submission).

Next submission: Mar. 15, 1999. Will order enough chips for summer '99 testbeam run.

New 96-channel Front-end Boards

5 boards manufactured. Boards will be stuffed next week at Fermilab using new 16-channel chips.

Future 96-channel Analog/Digital Boards

Analog part almost identical to new front-end board. Design almost finished.

Digital part will be done by UCLA, finished by end of March.

Boards ready by April for latest chips which will arrive in May.

Radiation Tests

Will test ASIC's at Ohio State's reactor in March.

We will have to find another reactor to test an entire board.

Findings with Present Chip and Board

LATCH-UP

1) Shielding output cables greatly reduced latch-up occurence.

2) Latch-up on one board was entirely due to 1 chip – removing that chip eliminated all latch-up on that board.

HIGH THRESHOLDS DUE TO AMPLIFIER OSCILLATIONS

1) Very dependent on the input capacitance of the chamber and cable. Worst at the wide end of the chamber – we now do all our studies there.

2) The present input cable adds about 20 fC to the minimum threshold.

3) Chips are independent of each other. Oscillations on one chip do not influence other chips.

4) Oscillations within a chip are very correlated. If one channel oscillates, all the channels in the chip oscillate.

5) Placement of chip on the board does not affect the threshold.

Ramifications

1) We need a chamber with large wire capacitance for testing our new electronics. So we would like to keep P2' at Fermilab and send P3 to UCLA until P2" is finished in June.

2) We need ten 3377 TDC modules to test a full chamber of electronics for the Fermilab cosmic stand and for the CERN summer tests. Cost $\approx$ \$30k.