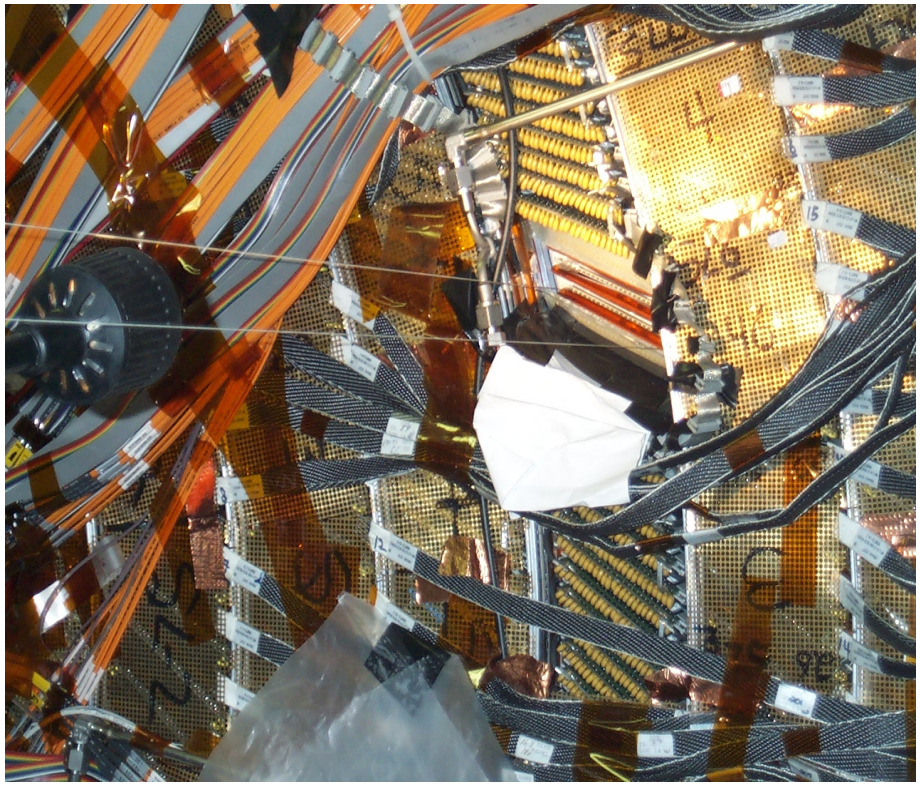
CDF Operations Summary

Arnd Meyer
(Fermilab)
April 22, 2002

- COT broken wires
- Supervised access
  Tuesday 6am - Friday 2pm
- Silicon status / radiation study
- Level 2 progress
- Limited data taking
  (Silicon unbiased, COT)



Store			Initial Lum	Duration	$L_{delivered}$/nb	L_{live}/nb	Eff/%
1216	Fri	4/19	7.3E30	6.5	147.1	90.1	61.3
1217	Sat	4/20	16.5E30	3.1	157.7	139.6	88.7
1224	Sun	3/21	12.8E30	14.8	441.2	300.4	68.1
					746.0	**530.1**	**71.1**

Extraction of Broken COT Wire I

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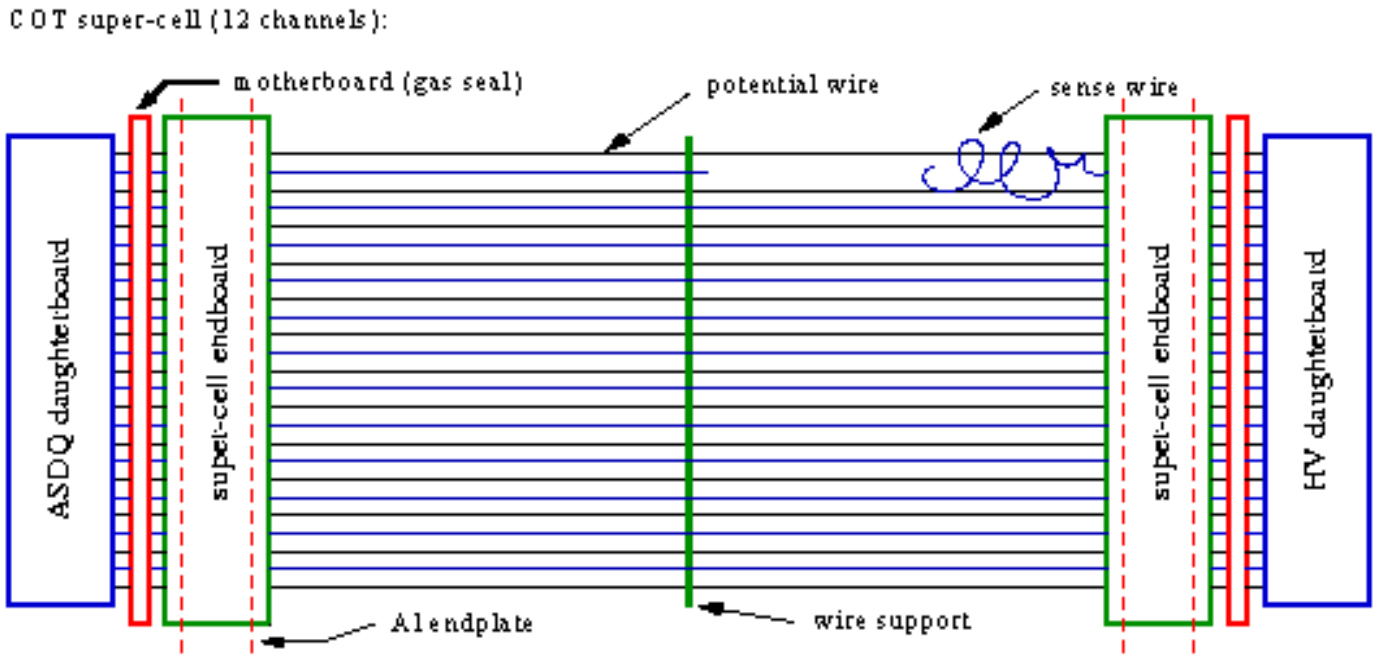
- Sunday night (4/14), COT developed trips in adjacent superlayers 2 and 3, suggesting a broken wire around phi ~ 0.
- Shorts in
  - SL3, Quadrant A: P12, S11, P11, P10
  - SL2, Quadrant D: P09, S06, S05
- Calibration pulse testing on Monday indicated a very likely candidate broken wire, on the ASDQ side of the half-way support bar:
  - SL3, Quadrant A, cell 002, S11



Extraction of Broken COT Wire II

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April 22, 2002

- Began purging with N_2 on Monday
- Supervised access Tuesday 6am, start to open endplugs
- Original plan for wire extraction, based on November experience:
  - Remove electronics
  - Break gas seal
  - Attach weights on pulleys
  - Pull endcard out enough to grab and clip loose wire
  - Re-insert wire plane
  - Re-mount electronics
- Would have been finished in 2 days, but...
- Tuesday afternoon: broken wire's cell lies under one of the SUVA cooling lines on the West, contrary to schematics
  - Start flushing SUVA, an 8 hr process
  - Keep practicing with the stringing apparatus in parallel, set-up in bore
- Resistance and capacitance measurements indicate that the wire broke very near the ASDQ (need spooling instead of pulleys)

Extraction of Broken COT Wire III

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- Wednesday morning: key person left
- Wednesday noon: lead tech sent to the ER with twisted knee
- Positioning piece broke (known weak part, bad luck), needed to be reglued
- Wednesday evening: 2 more wires break during extraction
  - Revise strategy, will remove complete wireplane
- Thursday noon: wireplane has been extracted, reinstallation and checkout begins, finished by 2am Friday
- Start closing detector Friday 6am, ready for collisions Friday afternoon
- Full HV test with Nitrogen Friday evening, switch to Argon/Ethane
- Full HV test with Argon/Ethane after 3 volume exchanges (Sunday afternoon) $\rightarrow$ we see tracks again!!!
- 100% gain late Monday evening (5 volume exchanges)

Summary COT Repairs

Arnd Meyer
(Fermilab)
April 22, 2002

- Access was four shifts longer than expected
- Experienced unanticipated problems
  - Nonetheless, well aware of planning deficiencies
- Lost 12 of 30240 channels
  - Success!
- SL3 tripped once in Ar/Et - cautiously running at 98.5% for now (sense wire 2 of quadrant A reduced by additional 100V)
- Wireplane will be replaced in a future, longer access

Other Access Work

Arnd Meyer
(Fermilab)
April 22, 2002

- Replaced COT VME power supply (lost during shot setup Monday April 15)
- Repaired dead/noisy channels in CMP, CMX, WHA, CSX, SMX
- Calorimeter calibration system
- Track Trigger, Miniplug, Silicon electronics
- Plug HV
- Many more smaller jobs

Silicon Status

Arnd Meyer
(Fermilab)
April 22, 2002

- Silicon has been OFF since 3/30 (6 SVXII ladders partially lost during beam abort)
- Circumstantial evidence for rate dependent failure mode (~2rad in ~150ns)
- New interlocks
  - RF interlock in place
  - Protection for missing abort gap marker
- Radiation exposure in Booster test facility
  - Observed recoverable chip failures, but no permanent damage
- Repeat test under improved conditions (needs ~4 hrs)
  - More parts (used a single Hamamatsu ladder)
  - Add target (used 8 GeV p beam directly)
  - More realistic DAQ conditions (readout/exposure simultaneously)
- The interlocks and the additional Booster test are prerequisites for turning the Silicon on
  - In addition, will tighten up operating procedures (loss limits etc.)

Level 2 Progress

Arnd Meyer
(Fermilab)
April 22, 2002

- The Level 2 decision system has been limited by backplane noise since many months
  - Artificially long L2 decision times (100μs instead of the design 20μs),
  - Max. Level 1 trigger rate ~5kHz
- This was acceptable for the current luminosity
- A system using TTL arbitration, reducing noise susceptability, has been developed
- After extensive commissioning, switched to the new system after the access - no major problems observed!!
- Immediate/short-term benefit: ~2 times increased Level 1 bandwidth
- Long-term: paves the way to the ultimate goal of 40-50kHz L1 accept rate

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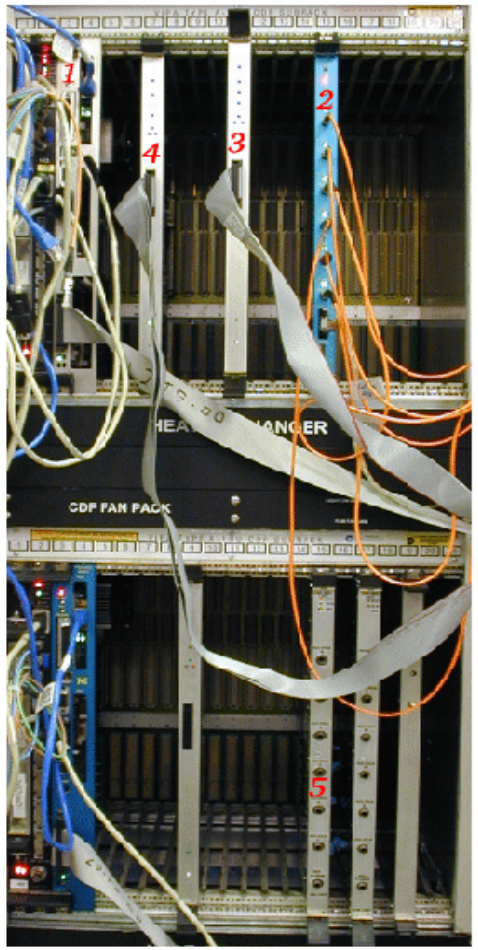

1. ALPHA
2. CLIST
3. SVTLIST
4. XTRPLIST
5. ISOLIST

On the Backplane
A. L1 INTERFACE
B. ReCES

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Summary and Outlook

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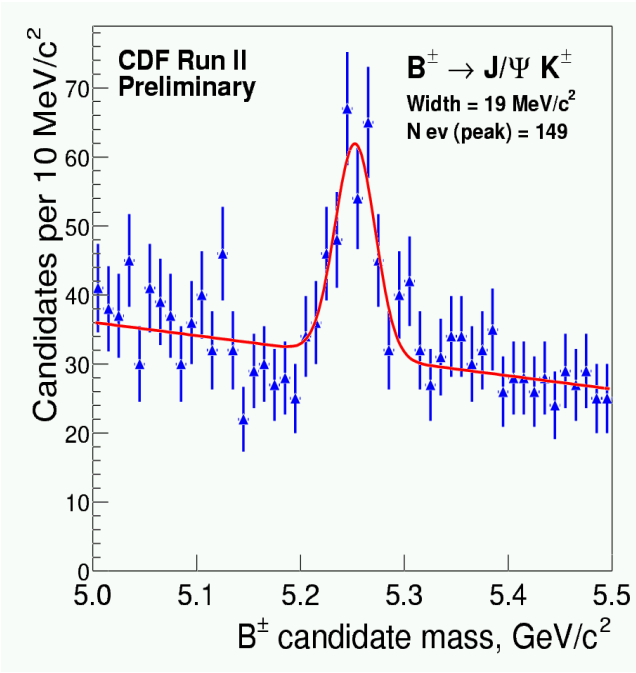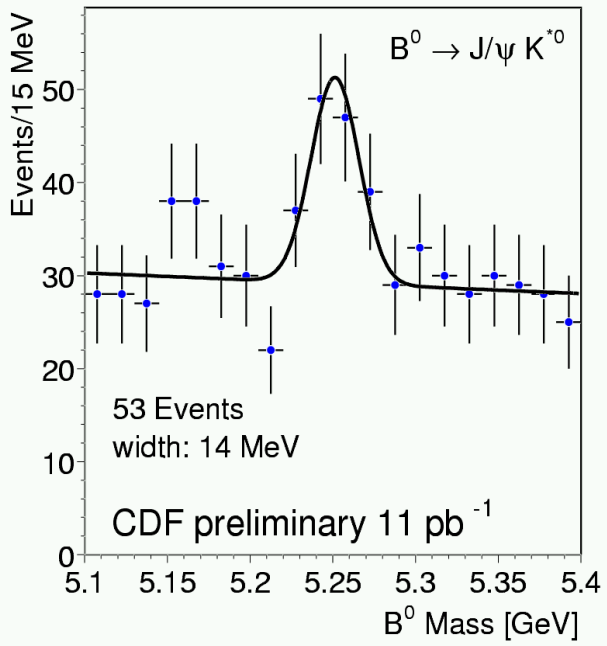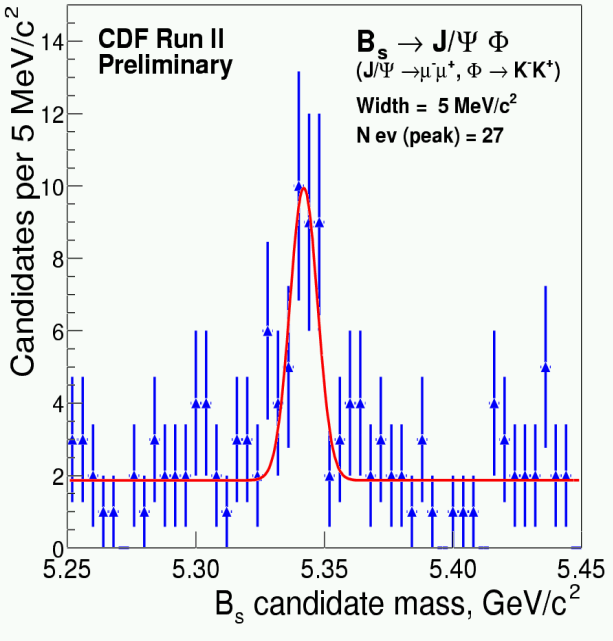
- A rough week, but close to being fully operational again
- COT will be at nominal gain tonight
- Turn on Silicon soon (Interlocks + another Booster test)
- Significantly improved Level 2 decision system