

## Tevatron collider progress: Jan'03 to mid-Mar'03

- I. Luminosity: → early Jan (4 stores #2123-2138)  
Average initial peak  $L=28.7$   
→ mid-March (5 stores #2315-2328)  
Average initial peak  $L=37.0$

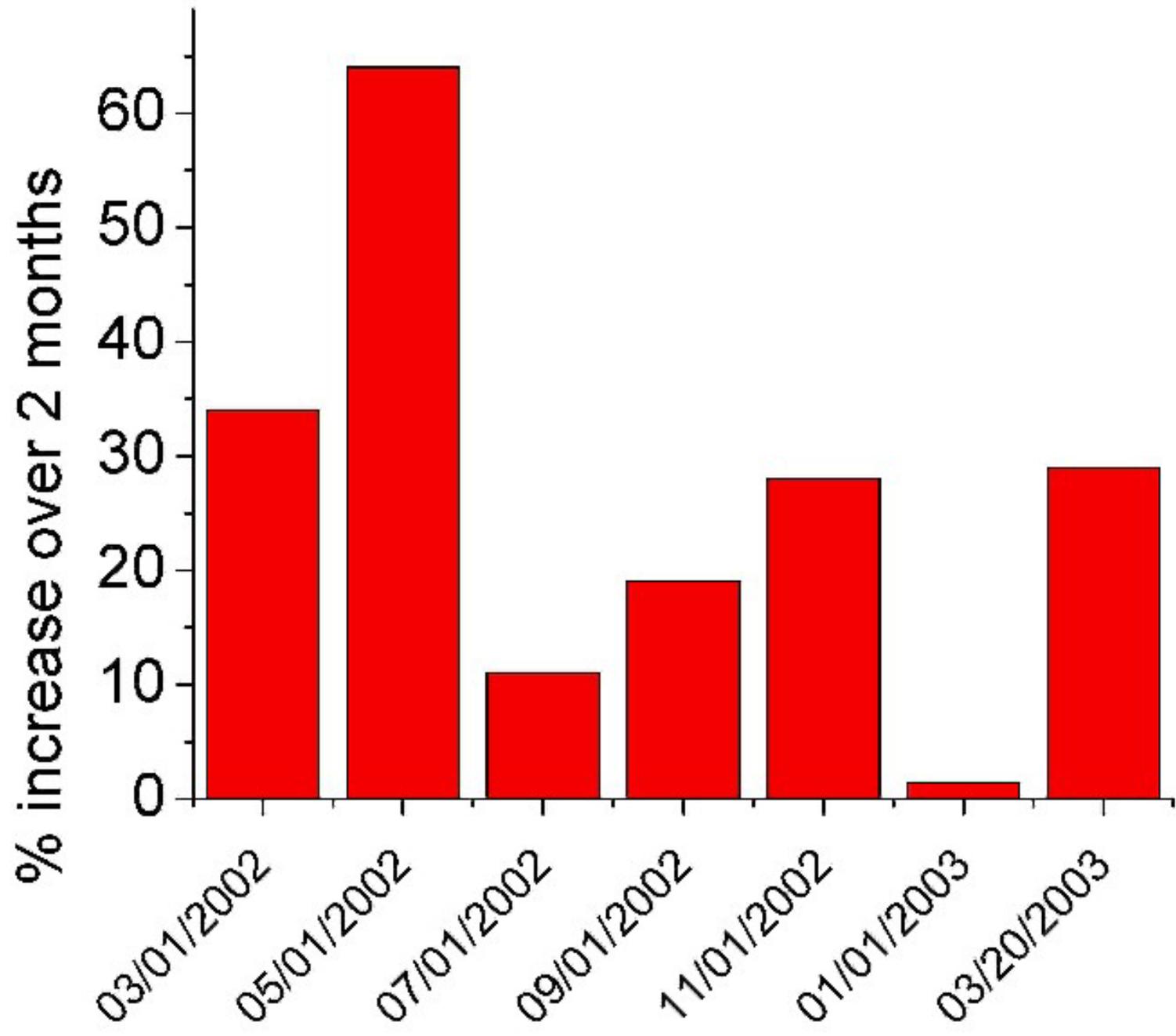
Gained 29% in peak luminosity

Record  $L$  as of Nov.7  $36.7e30$  store #1953

Record  $L$  as of Mar.20  $40.7e30$  store #2328

Reasons: +17% in protons  
+8% in pbars  
+3% in emittance (reduced)

Lifetimes of  $L$ ,  $N_p$  are worse now  
(esp  $N_p$  : from 120 hrs to 40 hours)



- II. Reliability: → bad: C3, A1 magnets replaced=2 weeks
- 16 pb<sup>-1</sup> since Feb (>20/mos before Jan)
  - high proton losses early in stores
  - TEL problems : from time to time

### III. Technical progress:

- Perfectly executed Jan shutdown: CO (PeterG, Howie), Schottky(Ralph, JimS), vacuum, TEL, alignment (Ray, JVolk), CDF shielding
- progress with FW correction (MC, SDA)
- PSD boxes removed (Fritz, MM, Marv)
- BPM specs finished (JimS)
- tunefitter works (Paul)
- tomography & IPMs started (Andreas)
- 1.7GHz Schottky commiss (RP, JimS)
- long&transv dampers back (Tan, JimS)

## Technical issues for next 2 months :

- (fast) chromaticities on-line (Vahid)
- finally correct FW, OAC (Jean+)
- make new Schottky handy (JimS, Andreas,RP)
- go thru Tev BPM review (JS+)
- $C_{v,h}$  and coupl from tunefitter (Paul, Markus)
- On-line IP waist data (Jean)
- IPM on high gears (Andreas,JVolk)
- A48 on high gears (Ron)
- QXRs in the tunnel (Andreas, JVolk)
- Quartz in Tev BPms (Tan's idea)
- A48 on high gears (Ron)
- Abort gap intensity monitor (Pordes, Harry)

## IV. Progress in Physics/Understanding:

- Tev Lumi model (Valery+)
- Closed TECooling (Vladimir+)
- Closed RecyclING (Valery+)
- Closed 132ns (Valery+)
- ~Closed A0 in FY'03 (BPDept)
- promising results with octupoles (PI, Jerry)
- closed microphonics (Reid, TD guys, VL, VS)
- b2 snaback measured (MM, Pierre Bauer)
- A48 solution (Drozhdin, Church)
- $C_{v,h}$  from head-tail (Vahid, Lorman, Peter)
- TEL progress (BBC team)
- Tev coupling smart bolts (MS, DE, JA, TD guys)
- Long-distribution (Alvin)
- DC beam from MI (Bruce, Vladimir)
- Tev optics progress (Valery, Aimin)
- B38 losses (Dean, Bruce)

## Issues, Studies needed:

- injection mismatch (VL, AX, +MI guys)
- spikes in LOSTP and EO abort gap (Tev, Alvin)
- accelerate helix work (Yuri +)
- Emittance blowup on ramp - real?
- Long-evolution at 150 (Alvin)
- DA and tracking vs reality (TS, BP Dept)
- CO vs FO impedance (Peter, Crisp, Burov)
- TEL with Gaussian gun (TEL guys)
- Beam-beam parametrization studies (TSen+)

## V. General comments:

- a) New BD Head → reorganization coming
- b) survived AAC review and DoE program review
- c) MCR training for 3 arranged by Jerry
- d) Garbincius, Pfeffer got "Letters of Recognition" from the BD Head
- e) Number of people to PAC'03 still undecided (2→7)

## VI. Expectations

(last time it was "We break  $40e30$  early March" ... happened March 16):

more pbars at LB

in 2 mos

- \* shoot from 180-200mA
  - 5-10% luminosity increase
- \* pbar efficiency improved (new helix, A1/P 1 lines, Tev ramp)
  - 3-10% luminosity increase

more protons at LB

in 2 mos

- \* may reach 230-240e9/bunch
  - ~10% luminosity increase

...as the result →

we'll be around  $45-51e30$  mid-May'03