

Tevatron collider progress: Nov '02 to Jan'03

- I. Luminosity: → late Oct (5 stores #1906-1918)
Average initial peak $L=28.3$
→ early Jan (4 stores #2123-2138)
Average initial peak $L=28.7$

no progress in peak, record integral 7.1 pb-1/wk

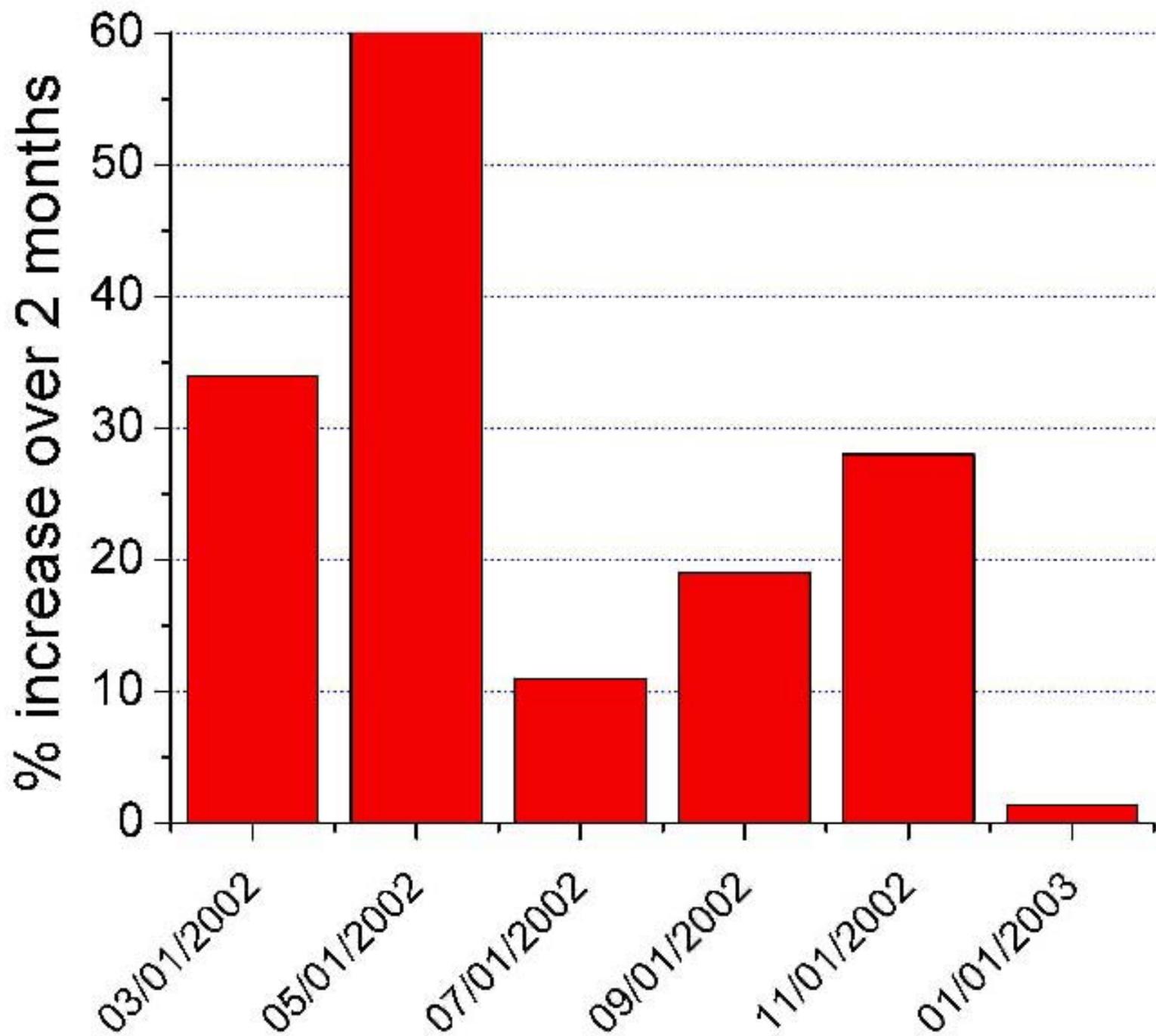
Record L as of Nov.1 $36.1e30$ store #1836

Record L as of Jan.1 $36.7e30$ store #1953 (Nov.7)

Reasons: - *run out of ideas*

- *just tuning does not help much in peak L*

Lifetimes of L , N_p are somewhat better (10-20%?)



II. Reliability: → so-so

- >40 pb-1 over last 2 mos (>20/mos in last 3)
- 7.1 pb-1 in a record (last) week
- studies do not affect reliability, L_{int} much
- kicker prefires an issue - several quenches
- orbit drifts a real issue
- TEL problems : from time to time
- problems with long/transv dampers

III. Technical progress:

- prepared for 3-week shutdown: CO, Schottky, vacuum, TEL, alignment, CDF (many+JVolk)
- survey data taken (Ray Stefansky)
- SL/FW/collim analysis (AJ,FZ,VS)
- better pbar Schottky (Markus Huening)
- tunetracker ~works (Paul+)
- 1st success in p-removal with collim (Tan)
- new scan-software tested (Aimin+)
- new abort gap counter at EO (Alvin, Morris)
- SBD dp/p, emm fixed; real rms σ_s (Instr)

Technical issues for next 2 months :

- **execute Jan'03 shutdown projects (CO, Schottky, Vacuum, Alignment, CDF, TEL)**
- recover after shutdown
- finally FW/SL emittances (Andreas)
- make new Schottky working (JimS, Andreas)
- Finalize Tev BPM requirements (JS+)
- Need of on-line $C_{v,h}$ msmts (PI, Vic, Vahid)
- What to do with kickers? (BH)
- Start IPM re-development (Andreas, JVolK)
- Get "old" pbar Schottky available (Markus)
- Start installation of injection dampers
- A48 collimators (Sasha Drozhdin, Dean +)

IV. Progress in Physics/Understanding:

- $Z_T = 3-5 \text{ M}\Omega/\text{m}$ from Lambertsons (PI, AB)
- New A-scan software tested (Aimin+)
- a model of $\sqrt{\text{time}}$ losses (Valery)
- luminosity scenario model (Valery+)
- pbar tunes bunch-to-b meas'd (FZ, XLZ, VS, Tan)
- promising results with octupoles (PI, Jerry)
- new RF noise results (VS, John Reid, TD gus, VL)
- b2 snaback measured (MM, Pierre Bauer)
- lifetime vs tunes, $C_{v,h}$ (TSen, FZ, XL, VS)
- loss on ramp scales with $C_{v,h}$ too (Tan)
- indications of e-cloud (FZ)
- WP scans with/w/o TEL (XLZ, Meiqin, Kip, VS)

Issues, Studies needed, After shutdown:

- injection mismatch (VL, AX, +MI guys)
- coupling effect on inj emittance (JA, PI, +)
- P,Pbar loss on ramp 12% as before (TS, VS +)
- Emittance blowup on ramp - real?
- optimize dampers (JS, Tan)
- 150 helix after CO (Yuri, JohnJ, MM+)
- decide upon AO (MM, JohnJ, VL+)
- make octupoles working (PI, JA)
- TEL with Gaussian gun (TEL guys)

V. General comments:

- a) Got enough time for studies again - need to deliver *peak L*
- b) AAC review Feb.4 (VS, MM, JA, Valery)
- c) Claudio Rivetta and Andreas Jansson joined Tev Dept
- d) Jerry will arrange Tev operation training for newcomers
- e) JimS, Tan and Dean got "Letters of Recognition" from the BD Head
- f) discipline of beam studies strengthened (plans, forms)
- g) 28 presentations at PAC'03, incl. 4 oral

VI. Expectations

(last time it was "Peak luminosity of $3.7-4.4e31$ early January" we had 3.67...):

pbar/p emittance improved ($<20\pi$ H at 150/LB?) in 2 mos

(Tevatron coupling, A1/P 1 lines, better MI emm, Tev ramp)

→ some 5-10% luminosity increase

more pbars to LB

in 2 mos

* better efficiency due to C0

→ 2-5% luminosity increase

* larger stack size (>190 mA)

→ some 4-8% luminosity increase

...as the result →

we break $40e30$ early March