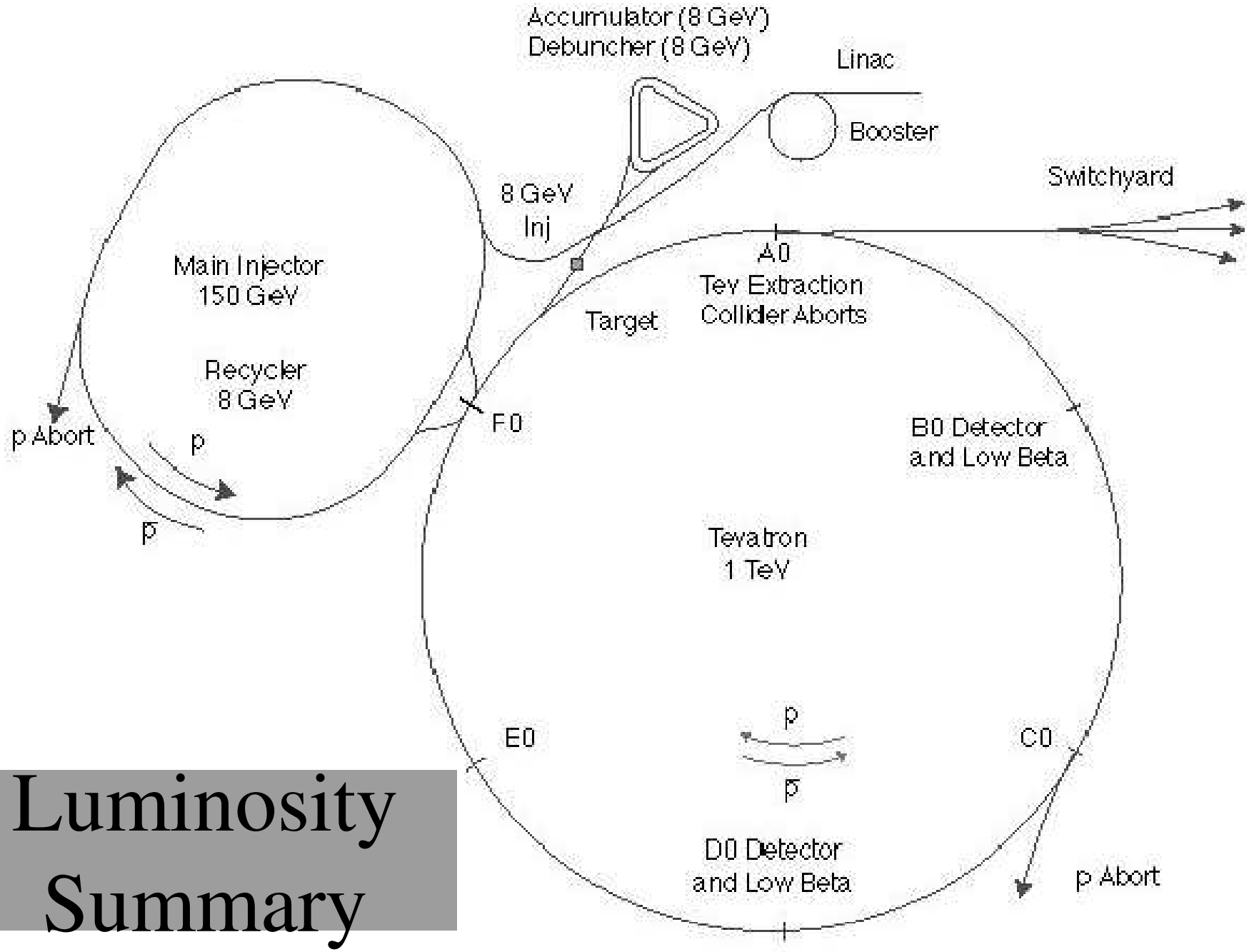


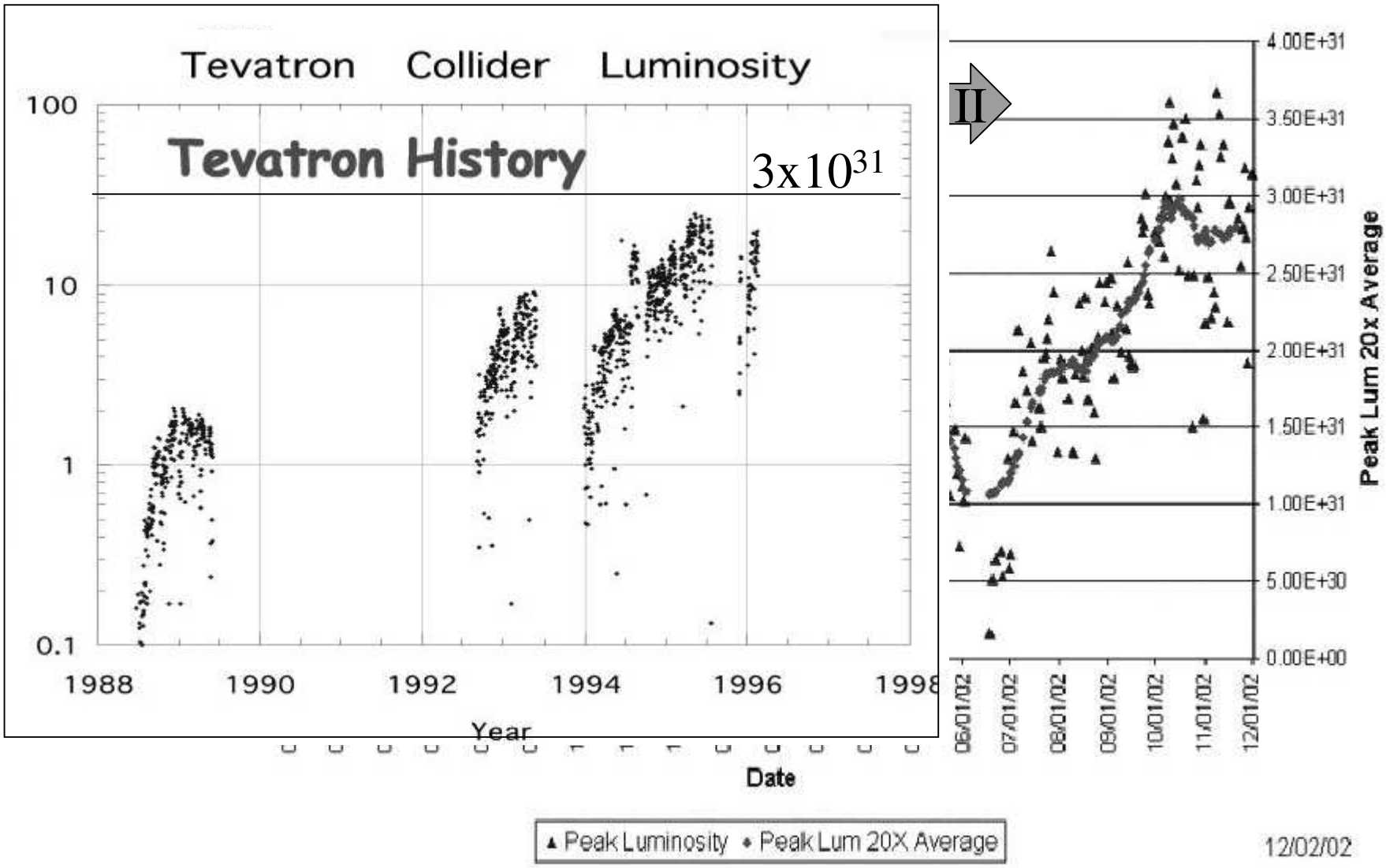
Luminosity Summary

Goals

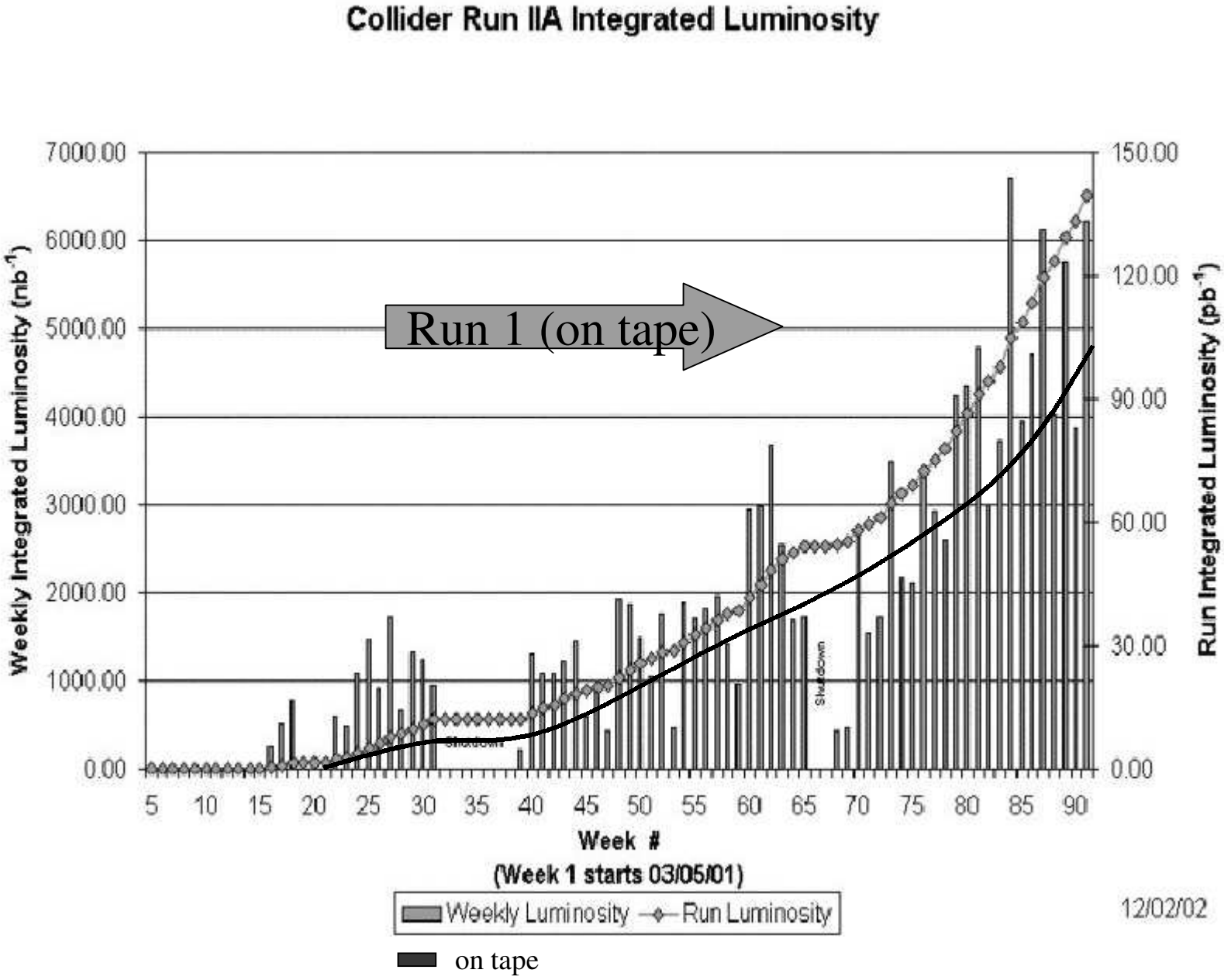
- When L'pool joined CDF:
  - Run IIa: 2fb^{-1} in 2 years, starting March 00
  - Run IIb: 15-33fb^{-1} by 2007

- Now:
  - Run Iia: 2fb^{-1} in 4 years, starting March 02
  - Run IIb: 6-8fb^{-1} by 2007

Collider Run IIA Peak Luminosity



12/02/02


Collider Run IIA Integrated Luminosity
Run 1 (on tape)
Weekly Integrated Luminosity (nb-1)
Run Integrated Luminosity (pb-1)
7000.00
6000.00
5000.00
4000.00
3000.00
2000.00
1000.00
0.00
150.00
120.00
90.00
60.00
30.00
0.00
5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90
Week #
(Week 1 starts 03/05/01)
Weekly Luminosity
Run Luminosity
12/02/02
on tape

Goals and current performance

$$L = \frac{10^{-6} f B N_p N_{\bar{p}} (6\beta_r \gamma_r)}{2\pi\beta^* (\varepsilon_p + \varepsilon_{\bar{p}})} H(\sigma_l / \beta^*)(10^{31} cm^{-2} s^{-1})$$

	Now	Run 2a goals	units
Protons/bunch	200	270	10^9
Pbar/bunch	26	30	10^9
Total Pbar	900	1080	10^9
Peak Pbar prod. rate	130	200	10^9/hour
Pbar:AA→ low β	0.60	0.81	
P emittance	20	20	π mm-mr
Pbar emittance	18	15	π mm-mr
Bunch length (p, rms)	0.61	0.37	m
Bunch length (pbar, rms)	0.54	0.37	m
Typical lum.	3.2	8.1	$10^{31}cm^{-2}s^{-1}$
Integrated L	5-6.7	16	pb^{-1}/week

Running with 3 [illegible]es

250pb^{-1} /year

600pb^{-1} /year

Short term plans

Deliver 100-130 pb^{-1} in 2002

Short (~3 weeks) shutdown in early 2003

- ☞remove obstruction to aperture in C0
- ☞others (dampers, TEL, etc)

During 2003

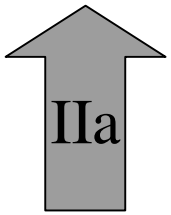
- ☞Work on Recycler
- ☞improvements to the Tevatron

By September 2003:
expect 200/320 pb^{-1} (base/stretch) delivered (per experiment)

Run 2 goal

accelerator challenge (in fb^{-1})

FY	base	stretch
2002	0.08	0.08
2003	0.2	0.32
2004	0.4	0.6
2005	1.0	1.5
2006	1.5	2.5
2007	1.5	3.0
2008	1.8	3.0
Total	6.5	11.



Hunting for the Higgs is one part of a wider physics program:

- $2fb^{-1}$ exclude m_H=115 GeV(*); SUSY at large tanβ
- $5fb^{-1}$: 3σ signal for m_H=115 GeV(*); search through most of the SUSY Higgs parameters space
- $10fb^{-1}$: 3σ signal for m_H=115-125, 155-175 GeV(*)

Looking for unexpected phenomena in our data

(*)Results from the Fermilab Higgs Working Group. Being reexamined by CDF and D0