

A Parameter Set Suggestion

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- This parameter set has been suggested by Hasan Padamsee at PAC05:

“Revisiting the cold ILC Parameters”

- I just want to propose it for the discussion since it makes life easier for the DR.

DR challenge: 2 pm vertical emittance

- B-factories:
 - Nb 3÷4 times ILC DR
 - Bunch separation ~ 3Km DR
 - Vertical emittance ~ 500 larger
- ATF:
 - Minimum measured $\epsilon_y = 4 \text{ pm}$

Double ϵ_y

- The large Spot Size set has large $\epsilon_{x,y}$ and long $\sigma_z \Rightarrow$ High disruption

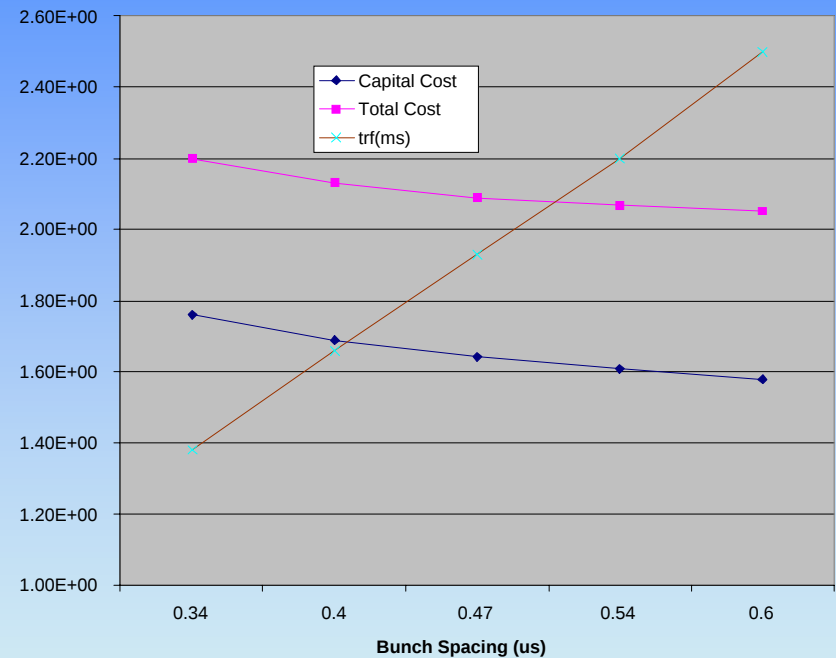
“This may be the most difficult parameter set for the BDS because of the larger angular IP beam sizes”

- It would be good to have **double** ϵ_y with short σ_z and smaller ϵ_x

Increase Linac Bunch Spacing

A longer beam rf pulse length lowers the peak beam power and therefore the number of (10 MW) klystrons as well as the peak power to be delivered by the couplers.

Fewer klystrons, fewer modulators and reduced coupler power lower capital cost.



High Rep Frequency

With respect to nominal parameters:

- Reduce by a factor 2 the number of bunches $\Rightarrow$ Reduce Damping Ring size
- Double the rep rate to **10Hz** to keep the same luminosity $\Rightarrow$ increases operating costs
- **Double the bunch spacing** in the linac to keep the same total cost $\Rightarrow$ capital cost (peak RF) decreases

	Nominal	High rep rate
Number of bunches	2820	1410
Rep rate (Hz)	5	10
Linac Bunch spacing (ns)	308	616
Linac pulse length	1 ms	1 ms

Longer bunch spacing and higher repetition rate would certainly help damping ring.

What about :

Positron source?

Intratrain feedback?

Low emittance transportation?

Detector?

Most critical parameter for Damping Ring:

Number of bunches $N_b = 5600$

The minimum bunch Δt_b distance in the DR is given by the kickers rise/fall time and by the collective instability.

The DR length is just

$$L_{DR} = N_b \Delta t_b$$

It is certainly possible to increase the number of bunches but it increases proportionally the DR length.