



# Towards a baseline configuration recommendation for the ILC damping rings

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Andy Wolski

*Lawrence Berkeley National Laboratory*

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## Baseline configuration will be decided by GDE in Dec 2005

The charge for the damping rings community is to recommend a baseline configuration to the GDE.

The *form* that the baseline configuration will take is still unclear.

Will there be a single document, or a set of documents?

What level of detail will be included?

How will alternatives and options be specified?

For the damping rings, I propose that we focus the recommendation on the high-level options and parameters.

The “Himel List” currently specifies only two decisions for which input is needed from WG3b:

Damping ring size and shape

Gamma-gamma upgrade path

I think we need to add to the list...



# Options specified in the DR configuration recommendation

## Circumference and layout (TF1,2,3,4,5,6,7,8,9)

~ 17 km dogbone

Are coupling bumps needed to reduce impact of space-charge effects?

3 km or 6 km ring

Single rings

Stacked rings (perhaps as an “upgrade” to allow 6000 bunches)

## Charge and number of bunches (TF3,4,5,6,7,8)

~ 3000 bunches with  $2 \times 10^{10}$  particles per bunch

~ 6000 bunches with  $1 \times 10^{10}$  particles per bunch

## Beam energy (TF3,4)

< 5 GeV

5 GeV

> 5 GeV



# Options specified in the DR configuration recommendation

## Injection scheme (TF5)

Timing pattern of bunch injection and extraction

## Injected beam parameters (TF1,2,4,5,6,7,8)

Injected emittances

Injected energy spread

## Extracted beam parameters (TF2,3,4)

Extracted emittances

Extracted energy spread

Extracted bunch length

6 mm

9 mm



# Options specified in the DR configuration recommendation

## Kicker technology (TF5,8)

“Conventional”: strip-line (or similar) with fast pulser

“Exotic”: RF deflecting cavities, Fourier kickers...

## Wiggler technology (TF1,8)

Hybrid

Superconducting

## RF technology (TF3,8)

Normal conducting

Superconducting

## Vacuum system (TF6,7,8)

Aperture

Residual pressure

Techniques for suppressing electron-cloud



# What is in the configuration recommendation (and what is not)

The configuration recommendation should include:

- circumference and layout

- beam energy

- injected beam emittances (transverse and longitudinal)

- extracted beam emittances (transverse and longitudinal)

- subsystem technology choices

  - injection/extraction system

  - wiggler

  - RF system

  - vacuum system

The recommendation of a configuration is not the delivery of a design.

Guidelines (but not firm recommendations) may be given for some options, for example:

- lattice type (TME, PI, FODO)

- momentum compaction

- fill pattern



## Documenting the damping ring studies

Thorough, detailed documentation of the studies presently being undertaken for the “reference” lattices is essential.

- The baseline configuration recommendations must be solidly supported.
- The studies provide a significant first step in the technical design work that will follow the baseline configuration decision.

I propose a single, *comprehensive* report with:

- Description of “reference” lattices.
- Description of analysis tools and methods.
- Presentation of analysis results.
- “Executive summary” of configuration recommendations.

I propose a mini-workshop in mid November 2005 to:

- collect and review the information for the Damping Ring Studies Report;
- agree the configuration recommendations.