

ILC Damping Rings Electron Cloud Working Group Meeting Introduction

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ILC Damping Rings: Summary of Configuration Recommendations

December 6, 2005

Circumference

The positron damping ring should consist of **two** (roughly circular) rings of approximately 6 km circumference in a single tunnel. Electron-cloud effects make a single ring of circumference 6 km or lower unattractive, unless significant progress can be made with mitigation techniques.

Changed to 1 ring
Aug. 2006

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The feasibility of the baseline depends on:

- further progress with developing techniques for suppressing electron cloud (positron rings);

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Alternatives

1. If techniques are found that are sufficiently effective at suppressing the electron cloud, a single 6 km, or possibly smaller, ring can be used for the positron damping ring.

Issues Ranking

Issue	Significance	Risks			
		3 km	6 km	2×6 km	17 km
Electron cloud (positron ring)	A	4	3	2	2
Kickers	A	3	2	2	2
Acceptance	A	2	1	1	2
Cost	A	1	2	3	3
Ion effects (electron ring)	B	3	2	2	2
Space-charge	B	1	1	1	2
Tunnel layout	B	1	1	1	2
Availability	C	1	1	1	1
Classical collective effects	C	2	2	2	2
Low-emittance tuning	C	2	2	2	2
Polarization	C	1	1	1	1

Summary of Configuration Recommendations

December 6, 2005

- Present Baseline since TILC08
 - 6.4 km DCO4 lattice, 2600 bunches, 6 ns bunch spacing
- SB2009 proposed as new baseline for TDP
 - 3.2 km DSB3 lattice
 - **Nominal** - Low power option: 1300 bunches, 6 ns bunch spacing
 - **Luminosity upgrade** - High power option: 2600 bunches, 3 ns bunch spacing

- The Second Baseline Assessment Workshop will focus on proposed changes to the ILC Technical Design Baseline and will prepare recommendations to the Top Level Change Control (TLCC) evaluation panel (chaired by GDE Director)
 - **1 Reduced Beam Parameter set**
 - **2 Positron Source Location**
- Charges for DR
 - **Evaluation of SB2009 performance with 6ns bunch spacing**
 - **Upgrade path: 3ns bunch spacing**
 - **R & D strategies**
 - **Cost impact**
 - **Performance impact**

- Prepare the recommendations for electron cloud mitigations in the positron damping ring with **6 ns bunch spacing**

Next steps (ready for BAW2)

- Give a risk evaluation for the high power option upgrade: **3 ns bunch spacing**
- Identify items that need further R&D

Mid 2011

- Detailed report of e-cloud working group