

Initial Comments from the RD's SB2009 Working Group

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- > Working Group Members: Mark Thomson, Tom Markiewicz, Karsten Buesser,
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- > Concerns:
- > o The main concern is the impact of SB2009 on the potential physics programme of the ILC. In particular the possibility of studying a low mass Higgs boson at the optimal centre-of-mass energy of $\sqrt{s} \sim 250$ GeV. Understanding the nature of the Higgs boson is central to the ILC and reduced luminosity at low energies could significantly damage the physics reach of the ILC.
- > o Increased beamstrahlung reduces the useful luminosity at given centre-of-mass energy.
- > o Beam energy spread is also important; in the Higgs recoil mass analysis, this is the limiting factor for the LoI studies (RDR parameters).
- > o Increased backgrounds will impact on detector performance, e.g.
 - > - may imply moving VTX inner radius out to 20mm, which will degrade (somewhat) flavour tagging performance and may have a large impact on the ability to reconstruct the charge of displaced vertices.
 - > - increased background levels may result in moving the inner acceptance of the forward calorimeters (LumiCAL/BCAL) which will reduce the hermeticity of the detector.
- > o The above effects will degrade the physics reach of the ILC; we are concerned about the impact on the competitiveness of the ILC compared to the LHC and CLIC.
- > o There are concerns about the impact of the reduction of the size of the damping rings on possible upgrade options for the ILC.
- > o The narrowed margin for performance raises concerns regarding the risk for delivering the design luminosity; concerns include kicker jitter, collimation tolerances & jitter, traveling focus feasibility, and others.
- > o There were also questions about the economics of cost saving on the machine and longer ILC operation to reach the same integrated luminosity.
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- > Specific questions for the GDE:
 - > o to assess the physics impact, we need beam parameters at several key energies:
 - > 250 GeV (to compare with LoI),
 - > 350 GeV (a likely operating energy for SB2009),
 - > 500 GeV (again to compare with the LoI).
 - > o beam parameters should include electron/positron beam energy spread.
 - > o we would like to understand the effect on backgrounds/luminosity spectrum for SB2009 with vs without traveling focus.
 - > o for low energy operation, we would like to understand the GDEs position on a conventional positron source.