

Questions to the Physics, Detector, and Accelerator Communities on on-going ILC Design Studies.

Assumptions:- There have been no significant changes to the SB2009 Working Group Report presented at LCWS 2010, March 27, and to the PAC, by J Brau, or to the Status Report on SB2009 and Accelerator Design and Integration given to the PAC, May 12. 2010.

Questions:- Either new or raised in Beijing?

- 1) Is the doubling of the Higgs mass resolution, 43 to 93 MeV, of significance? (In report). This was related to an increase in Beamstrahlung in scenarios using a Travelling Focus and the general conclusion was that the impact on the physics program was dominated by the integrated luminosity rather than changes in the luminosity spectrum.
- 2) A related new question comes about in considering 10 Hz operation to increase the luminosity at energies less than 300 GeV. There are two options where the 5 Hz Lumi beam does or does not pass through the positron production undulator. In the latter (more expensive) case the E- beam would have a slightly smaller energy spread than in the RDR. A statement as in 1) above would aid in the R&D study program!
- 3) Are there new 'alternate' 4 or 5 year physics running scenarios based on today's limits which can be used in optimizing design and running scenarios. For example should the *Need to assess Higgs branching ratio (250 vs. 350 GeV), and investigate 350 GeV spin-parity analysis (as alternative to threshold cross section measurement)* question be considered?
- 4) In considering design studies of changes in the design of the final doublet to allow stronger focusing for low energy operation and higher luminosity (lower beta, larger collimation aperture), are there important detector issues that should be raised 'now' before we invest effort.
- 5) The PAC has made the statement that they support the low power design option as a cost containment proposal but want to see a clear strategy for a future return to full power capability. The technical issues associated with this question are and will be studied in any baseline changes, however we need a discussion of possible physics running scenarios. For example one might consider the following:-
 - Run 2 to 3 years with the SB2009 low power parameters, presumably at 350 to 500 GeV?
 - Shutdown for N months (where $N \leq 9-12$) Install more RF, new final doublet, system upgrades based on early operational experience (incl. detectors).

Start operation at any energy based what has been learned in physics and accelerator capability. IS THIS A WORTHWHILE DISCUSSION IN THE NEAR FUTURE?

- 6) What other parameter sets should be studied by a joint group? Are there any non-accelerator, detector, questions related to 10 Hz operation that have not been raised? Do we need to consider operation at energies say above 300 but less than 350 and different repetition rates? Can questions like these wait until the physics is known and can the machine design be optimized at a later date.
- 7) Can the increased sensitivity to jitter with the travelling focus be studied quantitatively? This would require some agreed upon scenarios for early running (1-2 years?) as this sensitivity is in itself coupled to having a strong beam-beam interaction which will increase with time. This can be argued to be both good and bad!