From: **satoru** satoru@icepp.s.u-tokyo.ac.jp
Subject: Re: ILC run plan
Date: February 23, 2017 at 6:42 AM
To: James Brau jimbrau@uoregon.edu
Cc: 山下了 satoru@icepp.s.u-tokyo.ac.jp, Lyn Evans lyn.evans@cern.ch, 岡田安弘 yasuhiro.okada@kek.jp

SY

Dear Jim, Okada-san, Lyn,

I just arrived Washington DC.

We have two things, one is for MEXT and funding agencies (official stream) dedicated to 250 GeV and then plus add a bit the way for the extensions to higher energies, the other is to show to the community for long range superior research chances foreseen with ILC facility.

My options in the previous mail intend to the second one,
and for the first one, we need to make a document first very much dedicated to 250 GeV (+ 350 GeV region) including now only the precision but also (more important) the meaning and physics impact from the precision.

Best regards,
Satoru

Satoru YAMASHITA
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> 2017/02/23 19:46、岡田安弘 <yasuhiro.okada@kek.jp>のメール:
>
> Dear Jim,
>
> In my opinion, we may consider
> Option 1
> 250 GeV and the first upgrade to 350 GeV and then to 500 GeV range
> Option 2
> 250GeV and then upgrade to 500GeV range with 350 GeV run.
>
> There is an obvious reason we would like to go to the top threshold region. If there is a relatively easy path to go to 350GeV, by preparing a slightly longer tunnel at the first stage or so, then we should consider going to 350GeV first. This needs careful studies of technical and cost issues. Going to 500 GeV range needs a major investment and it is not a good idea to stick to the number 500 GeV too much when we start considering a staging scenario seriously.
>
> With best regards,
> Yasuhiro Okada
>
>
> -----Original Message-----
> From: 山下了 [mailto:satoru@icepp.s.u-tokyo.ac.jp]
> Sent: Wednesday, February 22, 2017 4:03 PM
> To: James Brau <jimbrau@uoregon.edu>
> Cc: 山下了 <satoru@icepp.s.u-tokyo.ac.jp>; 岡田安弘 <yasuhiro.okada@kek.jp>; Lyn Evans

Cc: 山下了 <satoru@icepp.s.u-tokyo.ac.jp>, 岡田安弘 <yasuhiro.okada@kek.jp>, Lyn Evans <lyn.evans@cern.ch>
Subject: Re: ILC run plan

Dear Jim,

Thank you for the presentation, discussions at Valencia and the mail.
It is my personal opinion but it is good to have various options for the upgrade path, 350, around 500, including for long term extension up to TeV, even multi-TeV, region.
Now we do not need to precisely insist on exact 500 GeV number, around 500 (450-600) is also good.
It is good timing to revise the physics scope of ILC not to limited up to 500 GeV or same technology as it is now, but extend to higher energy and/or higher gradient (I think it's still better to stick to SCRF, Ni-compound), as Michael Peskin pointed out at LCWS2016 panel discussion time.

Now we should assume the Y2020 level for 250 to 350 GeV upgrade, but should NOT insist on the same level of the technology as it is now for SCRF for the big upgrade (large upgrade to or higher than 500 GeV) to come after 5-10 years of
250-350 operation. At least cheeper, and better than Y2020 level.

Assuming the technical progress from the 250 GeV technology (as it is now + a bit better SCRF for cost saving), then 2030 (imagine much better than now),
2040 (hopefully 2 times more gradient), 2050 (3 times more or higher), which level we may reach is good to explicitly show the power of the extendability.

I would say it is NOT good strategy for selling the project to insist on TDR story, i.e. with no technical progress, taking 30 year for the measurement only within 250-500 GeV range.

After 10 years, or 15 years, when technology becomes better, or be ready from the science and cost, we should go to higher energy as soon as possible.

There are may scenario we can show as the option, for instance,

option 1
we may seek a way of "easy upgrade" to 350 or 370 GeV range, which means only a bit longer tunnel than 250 GeV case, then 500 or higher will come next with digging tunnel when machine is operational at 250-350, then 500 or higher, then higher and higher according to the results of 250-500 or 250-350, ,,,

option 2
We may also look into the case for 250 —> 500 then 350.

option 3
We may also check the case for 250 —> 350 —> 700-1000 (higher gradient SCRF cavity)

option 4
250 —> higher and higher with roughly 30 km tunnel —> higher with 50 km tunnel assuming 2 time and 3 times higher SCRF gradient available in Y2040.

Above these are all my view points, and please hear Yasuhiro's opinion.

Best regards,
Satoru

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2017/02/22 8:28、James Brau <jimbrau@uoregon.edu>のメール:

Dear Satoru and Yasuhiro,

We are moving ahead with a revised physics run plan as we discussed in Valencia. This plan with begin with a first stage of 250 GeV running. In order to make the plan as useful as we can, we would like some advice on what you think would be a reasonable upgrade path. We are considering two possible paths. One would be to upgrade from 250 GeV to 500 GeV after a luminosity upgrade at 250 GeV. The 500 GeV upgrade might occur after 10-12 years of operation. After the machine reaches 500 GeV, a period could be devoted to 350 GeV running. As our H-20 plan shows the 350 GeV period would not need to be so long. The second path would be to upgrade to 350 GeV after the luminosity upgrade at 250 GeV and operation at 250 GeV with the upgraded luminosity, and then to do a 2nd energy upgrade to 500 GeV. We could do both plans to provide comparison and guidance. Or you might want to suggest an alternative.

Best regards,
Jim