

## OVERALL COMMENTS

**The introduction, the science case, and the summary do not say anything that is really unique to ILD compared to SiD, in particular there is no mention of the TPC. I think this needs to be fixed. The summary should probably do a better job of summarizing the actual results contained in the document.**

Style details.

1. Good to go through thoroughly with a spell checker. (example ispell).
2. All the sections should be consistent in terms of capitalization.  
In practice it seems better to avoid over-capitalization.
3. Be consistent in terms of British English / American English, presumably the former.

### Initial pages

Page iii) Integration -> integration

Vallee should have an acute?

### Section 1. INTRODUCTION

**This is a reasonable introduction. The word “intense” is overused. It is used twice here and in the summary and probably should be deleted in all three cases. (intense scrutiny in section 2 is OK in that context).**

*Page 1.*

L6. This documents -> This document

L10 Gev -> GeV

L10/11 “1 TeV, the largest possible energy reach of the ILC”. This does not send the correct message since the site geology and potential accelerating gradient could go beyond this. May be best to simply put a full stop after 1 TeV, and then merge the first two sentences.

The point is that it is not cost effective to imagine having different detectors for different energies, and that the detector design necessarily has to support a wide collision energy range. Or maybe change to “as conceived for the ILC program as discussed in the ILC TDR and/or DBD”.

L12 but maintain -> while maintaining

L22 effectiveness -> effectiveness

L23 criterium -> criterion

L32 adopt to -> adapt to (or did you mean just adopt).

*Page 2.*

L10. place -> place,

L15. 2018 cost seems a bit weird.

## **Section 2. SCIENCE CASE**

**This was pretty readable.**

*Page 3.*

L6 the Universe -> the very early Universe

L6 and L8 “the recombination” - needs to be better qualified, or rephrased.

Recombination of what? - maybe better still “formation of atoms”? And using words like transparency / opaque to light?

L21 EW->electroweak

L27 Electroweak -> electroweak

I would avoid introducing the unnecessary EW acronym here and in L28.

L28 Bing Bang -> the Big Bang.

L38 the ILD -> the ILD detector

*Page 4.*

L2 center -> centre (BE).

L7 1% or below level -> 1% level or below

L9 undertaking -> undertaken

L12 remove “which”

L13 includes -> include

L29. table ??

L30 center -> centre (BE)

## **Section 3: The ILC Environment**

**This section was straightforward and in good shape**

*Page 5.*

L7 inital -> initial

Table 3.1 should also have the beam size in z at the IP that is a fairly important parameter for the experiment.

L13 space after \approx

*Page 6.*

right->right section. Maybe invert the right/left description to left/right which is more natural. (Also these details might be better in the figure caption).

L5. period after 6.1.3

*Page 7.*

L21/22. “colliding detectors” doesn’t make much sense. -> “experimental programme”.

L23 High luminosity -> High instantaneous luminosity.

L23 cms -> cms energy (or maybe better to define  $\sqrt{s}$ )

L24 Polarisation -> Longitudinal polarisation. (I know that transverse is also feasible ... but probably best to make it explicit as longitudinal).

*Page 8.*

L2 c.f.table -> c.f. Table (add space)

L3 You mention TDR here, probably best then on page 5, L6

-> "upgradable to 1 TeV in the ILC TDR [5]." to have first defined it.

Fig 3.4. GuinePig -> GuineaPig

L8 e bunches -> electron and positron bunches

L10 still needs to be fixed / rephrased

L13 it reads as if the pairs are simply coming from standard photon conversions in material rather than spontaneous conversion in the strong electromagnetic fields associated with the beams. - need to rephrase a bit. Maybe they are best called "beamstrahlung pairs" and one refers

to one of the early works by for example Chen, or is this coherent beamstrahlung pair only an issue in the CLIC regime??

L15 sources sources -> sources

L20 this is the first mention of SiD. I wonder whether we need some more general information in the introduction that puts things in the historical context of the Lol process, and the "validation" of ILD and SiD. Maybe one could simply change

"the other proposed detector for the ILC" to "the other detector currently proposed for the ILC".

L23 ILC and SiD -> currently envisaged as ILD and SiD (Note ILC -> ILD !)

(We also need to stay open to new ideas / detector concepts rather than be a closed club ...)

L24 on detector -> one detector

*Page 9*

L1 suggest: turn-over -> turn-around

L3 have been -> has been

L9 lenghts -> lengths

L14 study on -> study of

Why no page 10?

#### **Section 4: ILD Concept**

**No major comments. In good shape.**

*Page 11*

Figure 4.1 might be better after the initial paragraph.

Fig 4.1:  $X_{\{0\}}$  not  $X^{\{0\}}$ .

The figure is nice.

L3 subdetectors performances -> performance of the subdetectors

L7 "conversion electron pairs". See remark above on L13 of S3. Maybe there is a better way to phrase this.

L8 to the -> for the

L9 into -> of

L10 conditions to -> conditions on

L15 EW -> electroweak

L16 its decays -> Higgs decay mode

L18 "demand" sounds like an economic term ;- ) Rephrase?

L19 flavors -> flavours (BE)

### *Page 12*

Figure caption "Iso-cost" -> "iso-cost"

L2 crowded -> crowded

L3 as -> than

L6 scheme -> scheme,

L7 simpler if one says

"requires the calorimeters to be positioned inside the coil."

L15 where -> were

L16/17 as function as -> as a function of

L17 They show -> This shows

L21 limited to 2 -> limited to two

L24 to DBD -> to the DBD

L25 parameters evolutions -> parameter evolution

### *Page 13*

L1 constrains -> constraints

L4 level-arm to the comparisons -> lever arm for the comparison.

L6 as CLICdp -> to CLICdp

L10 calorimeters depths -> calorimeter depths

L11 calorimeters radius -> calorimeter radii

L13 level-arm -> lever arm

## **Section 7: Physics and Detector Modelling**

**No major comments. In good shape.**

### *Page 87*

L13. My understanding is that the standard generator samples do not include loop corrections.

L22 are -> is

L22/23 These type of events -> This type of event is

L23 300 MeV 2 GeV -> 300 MeV to 2 GeV

Table 7.1 caption. hadron -> hadrons

Table would probably look better if the first column was centered, and the others right justified. I think the WB and BW cross sections are identical so you should probably put 0.245 expected events per BX for both.

### *Page 88*

Fig 7.1 It should be made clear whether the log is base 10 or base e. I would expect it to be ln if base e. In general it is better to include the base subscript. Here at least clarify this in the caption.

Fig 7.1 caption. extend -> extent

### *Page 89*

L12 reminder -> remainder

### *Page 90*

L1. So does the spike go even higher than displayed? Naively the y-axis should be chosen so that this is not suppressed.

Fig 7.3 caption. inner -> the inner

Radiation length can be expressed as a mass per unit area ( $\text{g} / \text{cm}^2$ ) or as a length for a given assumed density. So saying inverse  $X_0$  is a bit confusing ....

Might be better to figure out how to not use arbitrary units.

Fig 7.4 right. This does not explain at all what is plotted. Is it the energy weighted average longitudinal layer? What kind of particles is it for?

7.2.2 It is probably a good idea to make it clear here that this is for both the ECAL and the HCAL.

The example is just for the HCAL.

### *Page 91*

L7 strip-and -> strip and

L18 Birk's Law -> Birks' Law (he was called Birks not Birk).

L20 neighboring -> neighbouring (BE).

### *Page 92*

L3 suggest easier to parse if one says

"followed by an inwards road search based on a Kalman filter"

Footnote 1 "PandorPFA" -> "PandoraPFA".

Muon system -> muon system

L29 input -> inputs

L30 the applied -> then applied  
L31 optimizing th -> optimizing the  
L31 the momentum-energy consistency -> momentum-energy consistency

#### *Page 93*

L7 Leptons -> leptons  
L9 flavor -> flavour (BE)  
L10 the Fastjet -> Fastjet  
L12 flavor -> flavour (BE)  
L13 palette does not seem like the right word in a scientific document.  
Suggest palette -> variety  
L27 managable -> manageable  
L32 GEANT4 gateway -> GEANT4-based ? (gateway is a bit weird).  
L39 effect reducing -> effect of reducing

#### *Page 94*

Table 7.3 caption. About same number -> Similar numbers  
-> the large and small simulation models.  
Sum of -> The sum of the  
Not sure what  $6f(WW)$  means.  $WW$  is 4 fermion not 6 fermion. Is it  $ff WW$ ?

### **Section 10: SUMMARY**

*Maybe should try more to summarize what is actually in the document.  
I have not read it all yet so don't have too many specific suggestions.*

#### *Page 141*

L5 suggest  
“of an intense effort” -> “of the work”. (the intensity has been less than intense by many of the signees of this document !)  
L6 that we are -> where we are  
L7 if engineering -> of engineering  
L12 R& D -> R&D (remove space)  
L12 collaborations the ILD -> collaborations and ILD  
L16 both in transverse and in the longitudinal direction -> in both the transverse and longitudinal directions  
L22 have been shown -> has been shown (readiness is singular).  
L22 is been -> has been  
L24 build -> built  
L36 the potential -> the physics potential  
L38 Ref [146] is NOT the science case for ILC !