

Thesis Corrections

Steve Green

PDF where changes are highlighted in blue:

https://github.com/StevenGreen1/Thesis/blob/highlighted_corrections/thesis.pdf

Abstract

Comment	In Notes	Action
Spelling - Both		✓

1) Introduction

Comment	In Notes	Action
Spellings - Both		✓
Summarise My Research - Val	Yes	✓ Summarised alongside the chapter X contains Y bit.
Beam size information for CLIC (ILC?) - Val		✓ Added table showing numbers of particles and beam size. Referecned table in text.
Comment on Experimental Conditions at ILC - Aidan	Yes	✓ Paragraph added.
Latest diagram of CLIC beam - Aidan		✓ Emailed Konrad. Response received and image found and updated.
Discussion of beam halo muons - Aidan		✓ Clarification needed (p7). - Emailed and clarified. No comment needed.
CLIC physics energy motivation	Yes	✓ Top quark mentioned in CLIC section and why 380 GeV is a good energy for ttbar process.
Add discussion of beam when referencing image of CLIC beam	Yes	✓ Added discussion.

2) Anomalous Gauge Coupling Theory

Comment	In Notes	Action
Spellings - Both		✓
Neutrino Mass Limits (p10) - Val	Yes	✓ Information already included in table. Tritium decay ($p\bar{n} \rightarrow p\bar{p}n + e + \bar{\nu}_e$)
Make Q italics - Aidan		✓ Clarification needed (p10). - Emailed and clarified.
Motivation for BSM searches in EW sector e.g. naturalness (p18 ish)	Yes	✓ Added section. Made EFT + EWCL a subsection with this new bit as an intro.

3) Particle Flow

Comment	In Notes	Action
Spellings - Both		✓
Clarify pseudo-layer - Both	Yes	✓ Added clarifying statement into text.
Define coordinate system. This information is required in the introduction also. - Val	Yes	✓ Added picture and description of axes.
Compare ERes of calorimeters to LEP experiment also - Val	Yes	✓ Found data for OPAL and ALEPH. Comparison numbers added to table.
Mention figure 3.10 in text - Val		✓ Added sentence.
Reclustering comparison definition (p42) - Val	Yes	✓ Added comparison and sentences describing definition.
Define cut on displaced distance IP for V^0 decays (p41) - Val		✓ Added sentence.
Explain confusion larger at higher energies due to more challenging topology (p53). - Val		✓ Comment in text already explaining this, no change made.
Momentum from charged particle track, ID for e^+e^- and gamma, neglect mass otherwise description. (p24) - Val	Yes	✓ Added sentence to clarify.
Energy units and momentum units (p24, 27) - Aidan		✓ Added units.
Forward reference CLIC_ILD explanation - Aidan		✓ Forward referenced the CLIC_ILD detector.

Comment	In Notes	Action
TPC compare single point resolution to Si detector - Aidan		✓ Single point resolution comparison numbers added to sentence saying TPC poor single point energy res.
Brief discussion of non-Gaussian errors for JER. Also 90%/75% fit ranges. - Aidan		✓ Non-Gaussian reconstructed jet energy is discussed in the jet energy resolution section and the 75% fit region mentions that this aids convergence, so no action taken.
Complete spatial resolutions of pixel/Si strips. Including pitch. (p28)	Yes	✓ Added table and mentioned in text.
Physics of shower development and occupancy of calorimeter cells inside a shower (p25)	Yes	✓ Added sub-section to particle flow calorimetry section.
Explain V0 decays (p41)	Yes	✓ Added description of V0 decays.
Clarify track usage (p41)	Yes	✓ Have emailed to clarify all reco. No action taken.
Sentence explaining Birk's law (p38)	Yes	✓ Added sentence.
On page 45 clarify that neutral cluster doesn't have a track	Yes	✓ Added sentence.
Emphasise data comparison to simulation studies as it underlies rest of work (p53)	Yes	✓ Added summarising paragraph to emphasise this point.
Add error bars to data/MC comparison	Additional Email from Aidan.	✓ Updates plots and referenced in text.

4) CLICdp Vertex

Comment	In Notes	Action
Spellings - Both		✓
Clarification that I made lab measurements and helped with test beam measurements -Val		✓ Clarified this in introduction.
Description of lab setup - Val	Yes	✓ Added picture of devices mounted and explained use of FPGA board.
Energy of electrons in source test - Aidan	Yes	✓ Added and cited.

5) Energy Estimators

Comment	In Notes	Action
Spellings - Both		✓
Clarify form of weights in software compensation. Saying from calice empirical fit is ok. - Both	Yes	✓ Added clear sentence.
Scenario's of calibration constants for nominal detector. - Val	Yes	✓ Added table showing calibration constants for nominal detector.
Define physical volume of calorimeter hit - Val	Yes	✓ Clarified.
Comment on implication of the calibration procedure to a real detector - Val	Yes	✓ Added paragraph in summary of calibration section.
Individual hit energy distribution example for software compensation (p98) - Aidan	Yes	✓ Example added when determining optimal truncation.
Remove use of software trigger - Aidan		✓ Removed use of software trigger. Had to rephrase sections slightly too.

6) Optimisation Studies

Comment	In Notes	Action
Figure error (p117) - Both		✓ Corrected.
Spellings - Both		✓ Corrected.
Spelling error on axis (p143) - Both		✓ Corrected.
Clarify statement about hadron showers (p136) - Val		✓ Clarified.
Comparison of normal vs optimised detector or at least more discussion on that - Val	Yes	✓ Discussion added for most important variables, cell size and number of layers.
Cost/minimum cost (Cost per channel?) - Val	Yes	✓ Cost information exists and referenced, but not on a per channel bases.

7) VBS + AGC

Comment	In Notes	Action
Spellings - Both		✓ Corrected.
Isolated lepton finder efficiency. Details on isolation cut. - Both	Yes	✓ Clarified isolated lepton finder efficiency. Removed isolation cut description as not relevant with configuration used.
Jet energy resolution questions - Both		✓ Corrected JER calculation. Results comparable now.
Mark on ROC curve position of optimal significance cut - Both		✓ Added marker to ROC curve and added marker explanation in caption.
Importance ranking of MVA variables and distributions - Both	Yes	<p>✓ Rerunning classifier on same data set as the ranking information is destroyed post training.</p> <p>Making plots for the invariant mass of the highest energy boson and the number of particles in the highest energy jet.</p> <p>Added table to text with ranking and figures for three highest ranked variables.</p>
Cross section vs cross-section - Val		✓ Corrected.
Quote LHC sensitivities (p149) - Aidan	Yes	✓ Added numbers to the motivation section of physics analysis and comparison in the summary.
Calorimeter tuning for CLIC (p153) say not using calibration procedure or soft comp - Aidan	Yes	✓ Added to event reconstruction paragraph a few sentences clarifying this.
Add data taking times to get the luminosities quoted	Yes	✓ Added to first place where referencing the luminosities, which is event selection.

8) Summary

Comment	In Notes	Action
Spellings - Both		✓ Corrected.
Expand comparison of CLIC to LHC (Run1 and 2) for VBS analysis - Val		✓ Added more detail, but no concrete information about run 2 or beyond available.

Other

Comment	In Notes	Action
Make my name bigger in EPJC paper - Val		✓ Done.