My Amazing Thesis

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Doctor of Philosophy

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ABSTRACT

X was measured, we showed that $Y \neq Z$ and that $M_{\mathrm{H}} = 126$ GeV/c^2.

DECLARATION OF AUTHORS CONTRIBUTION

I did this, and that, and some of the other.

ACKNOWLEDGEMENTS

I would like to thank bla, and bla ...

Motto or dedication

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DEFINITIONS OF ACRONYMS

LHC Large Hadron Collider
Superconducting collider occupying the 27 km ring at CERN.

QCD Quantum Chromodynamics

CHAPTER 1

INTRODUCTION

1.1 HOW TO CITE

The Higgs discovery is cited [1]. [1, 2] The strong interaction is given in (2.1) from Section 2.1.

1.1.1 TABLES SUB-SECTION

Table 1.1 is an example of a table.

Table 1.1: Table of latencies in the Level 1 systems measured in bunch-crossings of 25 ns. This is a massively parallelised operation, which is factored into the total latencies being shorter than the sum of their individual components.

	Latency Contribution (BC)	
Muon Trigger	**54.0**	
Calorimeter Trigger	**56.1**	
Cables to PPM		20.6
Preprocessor for CPM (e/γ, τ/h)		15.0
Preprocessor for JEM (jets,E_{T})		17.0
Electron/photon hunting		14.0
Tau/hadron hunting		14.0
Jet hunting		18.0
$E_{\mathrm{T}}^{\mathrm{miss}}$ calculation		18.5
Scalar E_{T} calculation		18.5
CTP	**4.0**	
TTC	**3.1**	
Fibres to front-end electronics	**16.0**	
Receivers for front-end electronics	**3.0**	
Total Latency for L1A to reach all ROD	**82.2**	
Digital Pipeline Length	**100**	

1.1.1.1 ACRONYMS SUB-SUB-SECTION

Acronyms are defined in `acronym.tex`. Use an acronym with `\ac{}`, such as the Large Hadron Collider (LHC). Future use will then just show LHC. Other uses are:

```
\acresetall
    resets all acronyms to not used.
    Useful after the abstract to redefine all acronyms
    in the introduction.
\acf{label}
    written out form with acronym in parentheses,
    irrespective of previous use
\acs{label}
    acronym form, irrespective of previous use
\acl{label}
    written out form without following acronym
\acp{label}
    plural form of acronym by adding an s.
    \acfp. \acsp, \aclp work as well.
```

1.2 NEW CONTENT

Use `\cbstart` and `\cbend` to highlight changes to the document with a red bar.

CHAPTER 2

PHYSICS

2.1 QUANTUM CHROMODYNAMICS

Gluons, being themselves coloured, self interact. As a consequence, the Quantum Chromodynamics (QCD) potential between two quarks is given by

$$V(r) = kr - \frac{\alpha_s}{r}. \tag{2.1}$$

Here k is the spring constant from Hooke's law and α_s is the coupling strength of the strong interaction. Potential energy in the colour field increases linearly with separation of quarks until it is energetically favourable to pair-produce a $q\bar{q}$ pair. α_s is plotted in the region $2 < Q^2 < 200$ GeV in Figure 2.1.

Multi-figure example in Figure 2.2

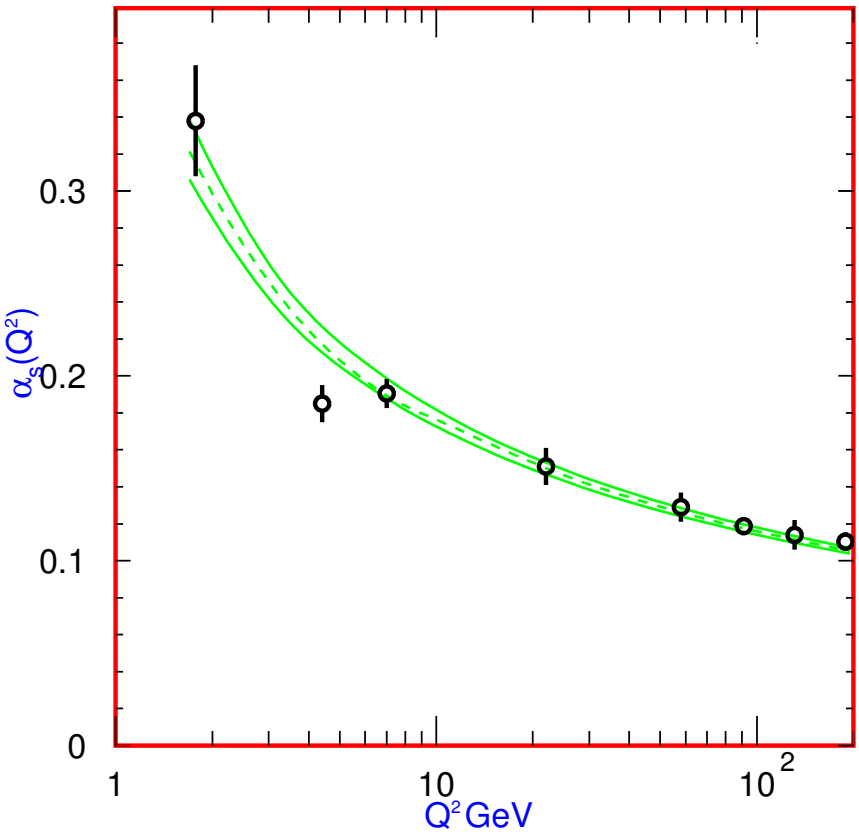

Figure 2.1: Strength of α_s as a function of energy scale. Data from various experiments are presented along with the central average and $\pm 1\sigma$ limits. Taken from [2].

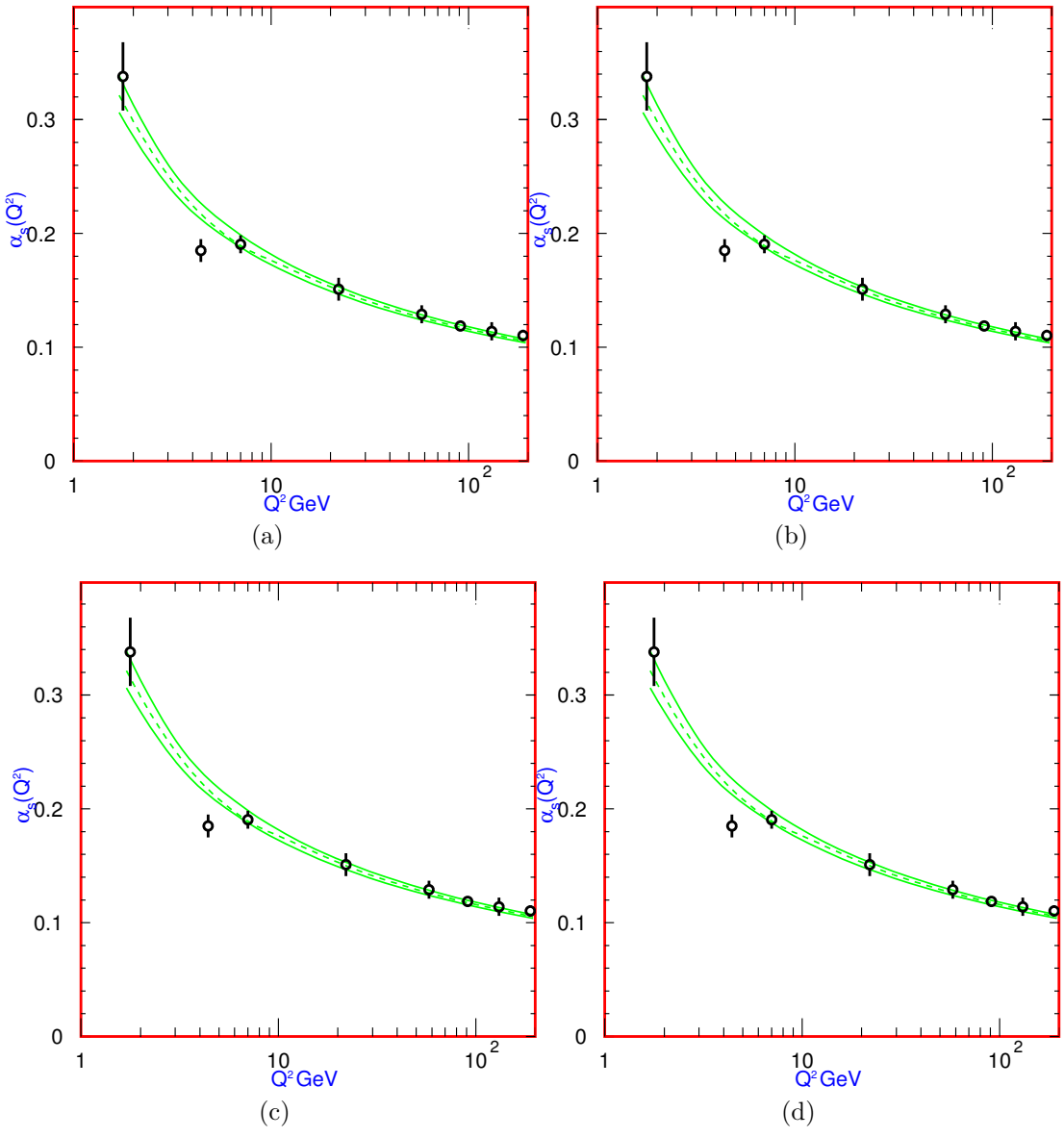

Figure 2.2: Example of four figures.

REFERENCES

[1] G. Aad *et al.*, "Observation of a new particle in the search for the Standard Model Higgs boson with the ATLAS detector at the LHC," *Phys. Lett. B*, 2012.

[2] W. M. Yao *et al.*, "Particle Data Group," *Phys. Rev. D*, vol. 86, 2012.

APPENDIX A

FIRST APPENDIX

Tables of datapoints...