

F91: Studying the Z boson with the ATLAS Detector at the LHC

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 (Carried out in the week of March 4th, 2019)

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I. INTRODUCTION

Just wanted to set up the `TikZ-feynman` package:

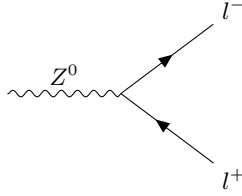


Figure 1: Leading order Feynman diagram for the Z boson decay into lepton pairs, inspired by [1]

Introducing Drell-Yan diagrams:

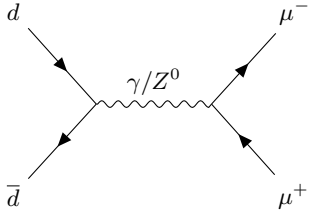


Figure 2: A simple Drell-Yan diagram, inspired by [2]

Already implementing the formulas mentioned in the theory part of [2] to speed things up a little.

$$\mathcal{L} = \frac{N_1 N_2 f_{\text{rev}} n_b}{4\pi \sigma_x \sigma_y} \quad (1)$$

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$$\mathcal{L}_{\text{int}} = \int \mathcal{L} \, dt \quad (2)$$

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$$N = \sigma_{pp \rightarrow X} \cdot \mathcal{L}_{\text{int}} \quad (3)$$

II. THEORY

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A. This is a subsection

1. This is a subsubsection

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language.

III. EXPERIMENT

A. Experimental Setup

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IV. RESULTS

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V. DISCUSSION

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Test	x_1 [AU]	x_2 [AU]	x_3 [AU]	Quantity
A	2,2	3,8	6,2	Q1
B	2,3	7,0	-	Q2
C	2,1	11,6	-	Q3
D	3,9	6,3	-	Q4
E	2,2	7,0	-	Q5

Table I: This is an example table.

about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language.

This is the second paragraph. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language.

And after the second paragraph follows the third paragraph. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language.

After this fourth paragraph, we start a new paragraph sequence. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language.

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ACKNOWLEDGMENTS

We would like to thank our supervisor Philipp Ott for his guidance throughout the operation of this experiment.

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- [1] M. Jende et al. *International Masterclasses - Hands on Particle Physics*. https://atlas.physicsmasterclasses.org/en/zpath_lhcphysics2.htm. (Accessed: March 5th, 2019).
 - [2] M. Wessels et al. *Studying the Z boson with the ATLAS Detector at the LHC - Manual V0.6*. Heidelberg University, 2018.