

## **Dedication**

To my parents and to my family and my tribe.

To my teachers and to my colleagues and my colleagues.

Candles that burn lights to others

To each of the characters taught me.

I dedicate this modest research wishing of God

Almighty to find acceptance and success.

## **Acknowledgements**

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## **Abstract**

Accelerators are utilized in the determination of the mass of elementary particles and the type of particles resulting from the collision of two or more of elementary parties.

This study is concerned with investigating the effect of different parameters on the determination of the masses of the particles produced by accelerators. The error in the masses of the produced particles is studied within the framework of Einstein generalized special relativity. This study shows that the mass error is affected by the potential and kinetic energy as well as the rest mass energy.

Assuming very large rest mass compared to kinetic and potential energy the calculations made for the error in the mass of the electron shows error of  $10^{-6}$  %, while the error is  $10^{-8}$  % for proton mass. These calculations show that the error in the masses of elementary particles is very small and is less than 1% in general.

## ملخص البحث

تستخدم المعجلات في تحديد كتلة الجسيمات الأولية وتحديد نوع الجسيمات الناتجة عن اصطدام اثنين او اكثر من الجسيمات الاولية.

وتهتم هذه الدراسة في بدراسة اثر المتغيرات المختلفة المؤثره علي كتل الجسيمات التي ينتجها المسرع, ويتم دراسة الخطأ في كتل الجسيمات التي تنتج في إطار نسبية آينشتاين الخاصة المعممه, هذه الدراسة تبين أن الخطأ في كتل الجسيمات يتاثر بطاقة الوضع وطاقة الحركة، وكذلك طاقة الكتله السكونيه.

بافتراض ان الكتله السكونيه كبيره جدا مقارنة بطاقة الوضع وطاقة الحركة, عند

حسابات خطأ  $l$  في كتلة الإلكترون يظهر خطأ في حدود  $10^{-6}$

اجراء . % لكتلة البروتون, هذه

$10^{-8}$

الحسابات تشير إلى أن الخطأ في حين أن الخطأ هو

. % في كتل الجسيمات الأولية هي صغيرة جدا وأقل من 1

## Table of Contents

Page No	Content
I	Dedication
II	Acknowledgements
III	Abstract
IV	ملخص البحث
V	Table of Contents
IX	List of Figure
XI	List of Tables
<b>Chapter 1</b>	

<b>Introduction</b>	
1	1.1 Accelerators
2	1.2 Research Problems
2	1.3 Aim of The Work
2	1.4 Presentation of The thesis
<b>Chapter 2</b>	
<b>Introduction of Elementary Particles</b>	
3	2.1 Introduction
3	2.2 Basic Constituents of Matter
4	2.3 Particle Classification
10	2.4 The Standard Model
10	2.5 Leptons and Quarks
20	2.6 Fundamental Force
22	2.7 Color Charge
23	2.8 Quark Confinement
24	2.9 Quantum Electrodynamics
25	2.10 Quantum Chromodynamics
26	2.11 Action at a Distance
28	2.12 Theory of Everything
29	2.13 Supergravity
30	2.14 String Theory

<b>Chapter 3</b>	
<b>Accelerator</b>	
32	3.1 Introduction
32	3.2 Particle Accelerator
34	3.3 History
35	3.4 How an Accelerator Works
37	3.5 Different Types of Particle Accelerators
38	3.5.1 Cockroft-walton
39	3.5.2 <i>Van de Graaf</i>
40	3.5.3 Linear
41	3.5.4 <i>Cyclotron</i>
42	3.5.5 <i>Synchrotron</i>
43	3.5.6 <i>Continuous Electron Beam</i>
43	3.5.7 Synchrocyclotron
44	3.5.8 Betatron
44	3.5.9 Colliders
<b>Chapter 4</b>	
<b>Determination of the Mass of Elementary Particles by Using Accelerators</b>	
46	4.1 Introduction
46	4.2 The Tools of Elementary-Particles

	Physics
56	4.3 Mass spectrograph
56	4.4 Effect of Mass According to Special Relativity:
57	4.5 Expression of Mass of Elementary Particles
<b>Chapter 5</b>	
<b>Determination of the Mass Error in Acceleration Experiment</b>	
58	5.1 Introduction
58	5.2 The Mass Error According to Einstein Generalized Special Relativity (EGSR)
59	5.3 Electron and Proton Mass Error
60	5.4 Discussion
61	5.5 Conclusion
62	<b>References</b>

## List of Figures

Fig 2.1 the baryons and mesons.....15

Fig 2.2 the basic quark and antiquark triplets ..  
.....18

Fig 2.3 .....  
.....19

(a) The octet of  $\begin{matrix} -\frac{1}{3} \\ 0 \end{matrix}$  mesons.

(b) Quarks flavor assignment for the  $\begin{matrix} -\frac{1}{3} \\ 0 \end{matrix}$  mesons.

(c) The octet of  $\begin{matrix} +\frac{1}{3} \\ \frac{1}{2} \end{matrix}$  baryons.

(d) Quarks flavor assignment for the  $\begin{matrix} +\frac{1}{3} \\ \frac{1}{2} \end{matrix}$  baryons.

Fig 2.4 virtual photons.....  
.....24

Fig	2.5	color	forces.....	
.....				26
Fig	2.6	action	at a	
distance.....				27
Fig 3.1 A Cockroft-Walton accelerator. The symbol $q$ in the formula refers to the charge of the particle.....38				
Fig	3.2	A Van de Graaff	accelerator ..	
.....				39
Fig	3.3	Side view of a linear	accelerator .....	
.....				40
Fig	3.4	a schematic of a	cyclotron	
.....				42
Fig 3.5 the electron accelerator at Thomas Jefferson Laboratory ....43				
Fig 4.1 Top quark event from the CDF experiment operating at the Tevatron collider. (Courtesy of the CDF collaboration at Fermilab.) ..51				

## **List of Tables**

Tab 2.1 categories of particles.....6

Tab 2.2 stable particles together with some of their properties.....6

Tab 2.3 properties of the quarks by Gell-mann and Zweig.....16

Tab 2.4 properties of the antiquarks by Gell-mann and Zweig.....	16
Tab 2.5 summary of the quantum numbers of the $J_p = 0^-$ meson and the $J_p = 1/2^+$ baryons.....	17
Tab 2.6 fundamental particle....	21
Tab 2.7 Bosons (force carriers) ..	22
Tab 4.1a Elementary-Particle Physics Facilities Operational in the World Today—Collider Facilities .....	54
Tab 4.1b Elementary-Particle Physics Facilities Operational in the World Today—Stationary Target Facilities ....	55