Dedication

I dedicate this work to my family. A special feeling of gratitude to my loving Parents for their endless love, support and encouragement.

Acknowledgements

It is my pleasure to express my gratitude Sudan University of science and technology, collage of graduate studies, faculty of science and department of physics.

I would like to express my sincere appreciation and gratitude to my supervisor

Prof**.** Mubarak Dirar AbdAlla for his guidance during my research. His support and inspiring suggestion have been precious for the development of this thesis content.

Finally, my greatest gratitude goes to my best friends (Sahar and Donyay)for being with me in every moment, motivating and encouraging me to go forward in my thesis.

Abstract

The generalized special relativity and energy-momentum relation beside the dual nature of microscopic particles was used in deriving spin quantum equations for spinning particles.

The Schrödinger equation with additional term which obtained to describes spinning particles.

Then Dirac generalized special relativistic quantum equation was used to derive anew equation by using simple mathematical methods for particles having spin and it is reduces to ordinary Dirac equation for Minkowskian space for Euclidean space.

المستخلص

أُستخدمت علاقة الطاقة والإندفاع فى النظرية النسبية الخاصة المعممة بجانب الطبيعة المزدوجة للجسيمات الدقيقةلإشتقاق معادلات كمية للجسيمات المغزلية.

وتحصل على معادلة شرودنجر للجسيمات ذات الطبيعة المغزلية بإضافة حد يوصف طبيعة الجسيم المغزلية.

كما تم أيضا إستخدام معادلة ديراك النسبية الخاصة المعممة وتم إشتقاقها لوصف الجسيمات ذات المغزل بطرق رياضية مبسطة.وأتضح أنها تؤول لمعادلة ديراك العادية فى الفراغ الأقليدى المينكوسكى.

Contents

Chapter Three: Quantum Generalized Special Relativistic Equations