

Dedication

I dedicate this work to...

My mother, father,

wife, sons,

brother and sister

Acknowledgements

Praise to Allah who gave me the idea patience to accomplish this work.

I own adept of gratitude to my supervisor Professor Mubarak Dirar, for suggesting this work, for this Keeness to flow this project.

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Abstract

Particles that are moving within a bulk matter are affected by the surrounding atoms. This effect can be recognized by treating matter as a viscous medium. The expression of energy loss by particle in viscous medium was derived by relating it to the orbital angular momentum. This energy expression is used to find a new quantum law that accounts for the effect of viscosity. It was found that this equation is reduced to ordinary Schrödinger equation in the absence of friction. The solution of this equation shows that both energy and viscosity coefficient are quantized and are related to the orbital quantum number. The total energy reduces to that of ordinary one in the absence of viscosity. The Renod's number agrees with the known one. In this work the kinetic and potential energy, beside the viscous energy for harmonic oscillator and their relation to each other was found. The expression of viscous energy was simplified by relating the classical and quantum expressions according to correspondence principle. This viscous energy expression was added to the classical Hamiltonian energy to find the total medium energy. This total energy beside the wave equation of wave packet was used to find the modified Schrödinger equation.

مستخلص

تتأثر الجسيمات خلال حركتها داخل المادة بالذرات المحيطة بها، ويمكننا التعرف علي هذا التأثير باعتبار لزوجة الوسط داخل هذه المادة. وقد تم حساب الطاقة المفقوده للجسيمات التي تتحرك خلالها فوجد انها ترتبط بالاندفاع الزاوي المداري، وبناء علي هذه الطاقة تم تعديل قوانين كميته جديده لتشمل تأثير اللزوجة، فقد بين حل معادله شرودنجر المعدله بحد الطاقة المفقوده نتيجة للزوجة الوسط الي تكميم كلا من الطاقة ومعامل اللزوجة وارتباطهم بالاندفاع الزاوي المداري، كما ادي لنقصان الطاقة الكليه للجسم عن تلك المحسوبه في غياب لزوجة الوسط، كما وجدنا اتفاق لعدد رينولد بين كل النتائج المحسوبه، وفي هذا العمل قد تم ايجاد طاقتي الوضع والحركه للمهتز التوافقي بجانب الطاقة المفقوده نتيجة للزوجة الوسط والعلاقه التي تربط بينهم، فمن العلاقه التي تربط التعابير الكميته والكلاسيكيه للمهتز التوافقي تم وضع علاقه للطاقة المفقوده بواسطة لزوجة الوسط، وقد تم اضافة هذه العلاقه للهامتوني لايجاد الطاقة الكليه للمهتز في الوسط، تلك الطاقة التي استخدمت مع معادله الموجه للحزمه الموجيه لتعديل معادله شرودنجر للمهتز التوافقي.

Table of Contents

Dedication	I
Acknowledgements	II
Abstract	III
Abstract (Arabic)	IV
Table of Contents	V

Chapter One

(1-1) History of Quantum Mechanics	1
(1-2) Research Problem	3
(1-3) Literature Review	3
(1-4) The Aim of Work	4
(1-5) Thesis Content	4

Chapter Two

Quantum Mechanical Laws and Applications	5
(2-1) Introduction	5
(2-2) The De Broglie relation	5
(2-3) The Uncertainty Principle	6
(2-4) Wave Packet	8
(2-5) Wave Function	9
(2-6) Operator	10
(2-7) Schrödinger Equation	11
(2-8) Hydrogen Atom	13
(2-9) Bohr Model's	23
(2-10) Rigid Rotator Body	26
(2-11) Free Particle	33
(2-12) Harmonic Oscillator	35

Chapter Three

Literature Review	41
(3-1) Introduction	41
(3-2) Quantum Schrödinger String Theory for Frictional Medium and Collision	41
(3-2-1) Maxwell's Equations for Time Decaying Wave in Resistive Medium	42
(3-2-2) Friction Coefficient and Relaxation	43
(3-2-3) Derivation of frictional Schrödinger equation on the basis of frictional energy equation	44
(3-3) The Quantum Expression of the Role of Relaxation Time on Optical Absorption in semiconductors	48
(3-3-1) To Relate Quantum Relaxation Time with Absorption Coefficient	49
(3-4) Quantization of Friction for Nano Isolated Systems	54
(3-4-1) Schrödinger Equation in Presence of Thermal and Resistive Energy	54
(3-4-2) Harmonic Oscillator	57
(3-5) Quantum Radioactive Decay Law and Relaxation time	60
(3-5-1) Relaxation Time and friction	60
(3-6) Summary and Critique	64

Chapter Four

Modified Schrödinger Equation Due to Vacuum and Medium Viscosity	65
Modified Schrödinger Equation Due to Vacuum and Medium Viscosity	65
(4-1) Introduction	65
(4-2) Electron Energy Loss Due to Viscosity of Fluid Around Nuclear of Hydrogen Atom	65
(4-3) Effect of Viscosity on Total Energy of Electron in Hydrogen Atom	69
(4-4) Effect of Viscosity on Total Energy of Electron in	74

Hydrogen Atom According to Bohr Model	
(4-5) Friction of Electron in Hydrogen Atom	76
(4-6) Effect of Friction and Viscosity of Electron in Hydrogen Atom According to Bohr Model	80
(4-7) Effect of Viscosity for A Rigid Rotator Body	80
(4-8) Effect of Viscosity of A Particle in Free Space	84
(4-9) Work Done of Stock Force in Oscillation System	87
(4-10) The Effect of Viscosity on Oscillation System	88
(4-10) Discussion	91
(4-11) Conclusion	94
Suggestions for Future Work	94
Reference	95
Appendix A	103