شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأفلام قد أعدت دون أية تغيرات

يجب أن

تحفظ هذه الأفلام بعيدا عن الغبار

في درجة حرارة من ١٥-٢٥ مئوية ورطوبة نسبية من ٢٠-٤٠%

To be Kept away from Dust in Dry Cool place of 15-25- c and relative humidity 20-40%

بعض الوثائـــــــق الاصليـــــة تالفـــة

بالرسالة صفحات لم ترد بالاصل

Zagazig University
Benha Branch
Faculty of Science
Physics Department

A theoretical Study on Quarkonium Spectroscopy Using Breit Equation

A THESIS
Submitted in Partial Fulfillment of the
Requirements for the Degree of
Master of Science
(PHYSICS)

BY
MOHAMMED MAHMOUD MOUSSA

(B.Sc. Physics)

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Abstract

Abstract

A non-covariant but approximately relativistic two-body wave equation (Breit equation); describing the quantum mechanics of quark-antiquark systems interacting with one another through a potential containing scalar linear confinement, vector Coulomb-like and Breit potential parts; is presented. After expressing the sixteen component two-body wave function in terms of a radial and angular functions by means of the multipole expansion, the initial Breit equation can be reduced into a set of sixteen radial equations which, in turn, can be classified in accordance to the parity and the spin of states involved. The final equations are solved numerically. A comparison between our results and the corresponding experimental data shows that, the used potential can describe the interaction in quark-antiquark systems.

In chapter I a brief history about the discovery of elementary particles, its general properties and a general introduction about the forces in nature. The concept by which we chose the interacting potential in Breit equation and some selected previous works are given.

In chapter II a discussion about Breit potential and its constituent terms in the non-relativistic limit, and the used mathematical treatment to reduce Breit equation into its radial form are performed.

In chapter III a discussion about the new locations of singularity which appears in the final radial equations due to the reduction procedure is given. A comparison between our results and the available experimental data is also performed

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