شبكة المعلومات الجامعية

# بسم الله الرحمن الرحيم


شبكة المعلومات الجامعية


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# التوثيق الالكتروني والميكروفيلم

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# جامعة عين شمس

## التوثيق الإلكتروني والميكروفيلم

# قسم

## نقسم باللّه العظيم أن المادة التي تم توثيقها وتسجيلها
## علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

# يجب أن

## تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

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# بالرسالة صفحات
# لم ترد بالأصل

# Study of $^{6}$Li using Refined Resonating Group Method

By

**Hazem Abdel Azim Ali**

Assistant Lecturer

Department of Mathematics and Physics

Thesis

submitted to the Faculty of Engineering Cairo University in partial fulfillment of the requirement for the degree of

**Doctor of Philosophy**

In

**Engineering Physics**

*Faculty of Engineering*

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# ABSTRACT

Microscopic multi-channels calculations for the $^{6}$Li are described by the refined resonating group method (RRGM). Local soft core nucleon-nucleon potential which contains Coulomb, central, spin-orbit and tensor parts is used in scattering and bound state calculations.

The bound state wavefunction is considered as consisting of an α-n-p configuration with S and D waves and $^{3}$He-$^{3}$H configuration with S wave only. Other configurations are added to the above fragmentations to consider their effect on the excitation energies of the low lying states in $^{6}$Li. The scattering wavefunction is considered consisting of 6 fragmentations α –d, $^{3}$He-$^{3}$H, $^{5}$Li-n, $^{5}$He-p, $^{5}$Li$^{*}$-n, $^{5}$He$^{*}$-p . An energy range from α –d threshold up to 27 Mev center-of-mass energy is covered. Results of phaseshift analysis are reported and compared with experiments. Positive and negative parity transitions have been considered up to L=4. Threshold energies of different fragmentations are produced and compared with experimental data.