بسم الله الرحمن الرحيم

شبكة المعلومــــات الجامعية

التوثيق الالكتروني والميكروفيلم

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

﴿ قَـــسم ﴾

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها علي هذه الأفلام قد اعدت دون آية تغيرات

يجب أن

تحفظ هذه الأفلام بعيداً عن الغبار

في درجة حرارة من 15 – 20 مئوية ورطوبة نسبية من 20-40 %

**To be kept away from dust in dry cool place of
15 – 25c and relative humidity 20-40 %**

بعض الـوثــائق

الأصـليــة تالفــة

بالرسالة صفحات

لم ترد بالأصــــل

Observing Artificial Earth Satellites Using Satellite Laser Ranging

THESIS
SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS
OF THE AWARD
OF THE (M. Sc.) DEGREE

PRESENTED BY

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Supervised By

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SUBMITTED TO

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Approval sheet

Observing Artificial Earth Satellites using Satellite Laser Ranging
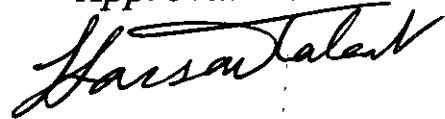
Name of candidate: Atallah El- Azab El-Taher.
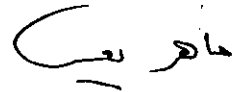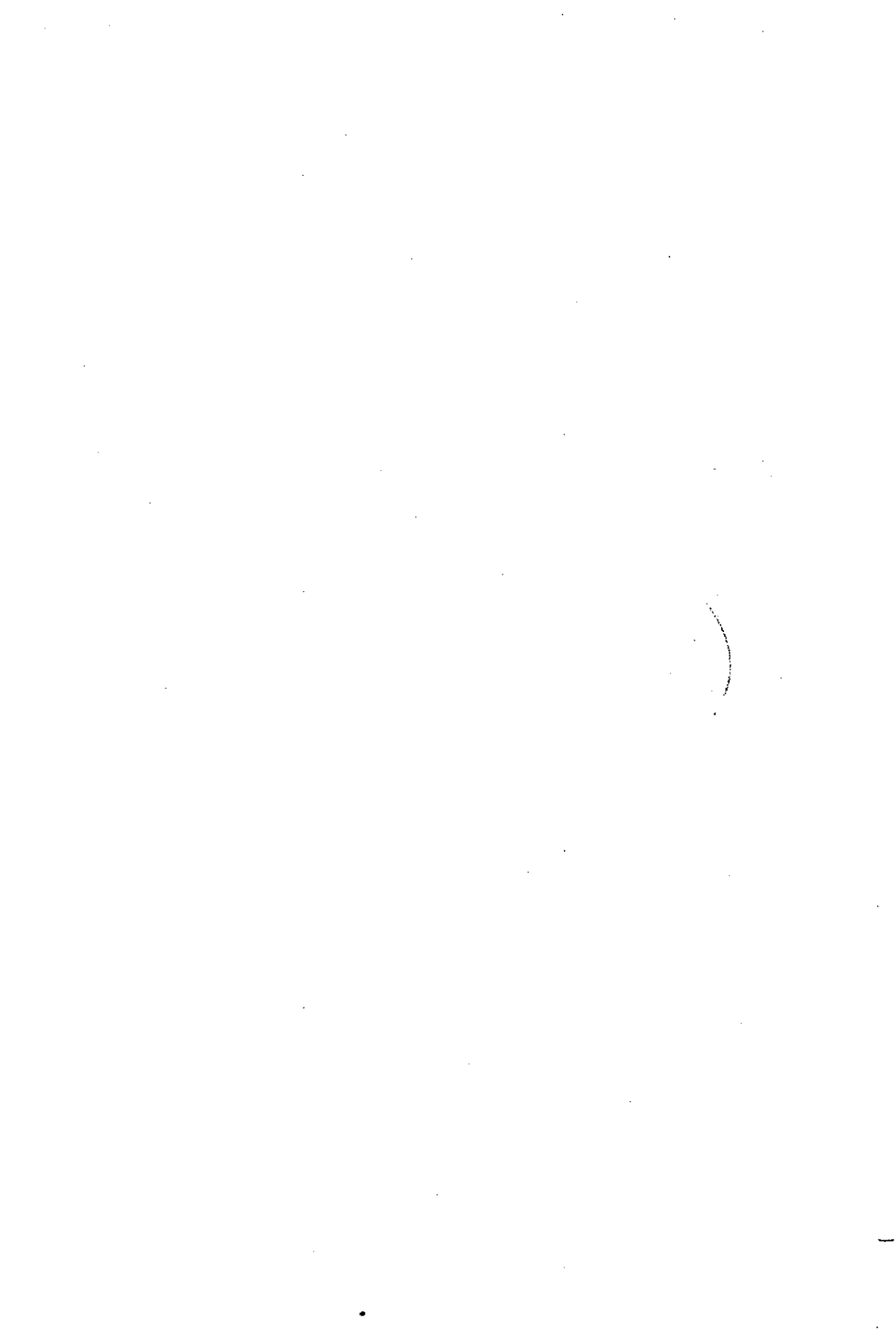Degree: (M. Sc.) Degree

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Summary

SUMMARY

The present thesis consists of four chapters and two appendix.

In chapter 1, the history of satellite laser ranging development is given since 1960 tell now to produce several millimeter single shot range precision and also a study for the different methods of satellite observation and full details about the laser system construction.

In chapter 2, the equipment's of the Helwan tracking station, the mount, laser transmitter, timing subsystem, ranging electronics' radar control programs and the hardware configuration of the control system and the software'. In chapter 2 also the satellite laser ranging data analysis, the polynomial data fitting have been carried for the satellites LAGEOS, AJISAI, ERS-2, FIZEA, RESURS1-3, STARLETTE, STELLA and TOPEX/POSEIDON. All the o-c residuals are given for these satellites and the overall precision estimate for the passes is given.

In chapter 3 we are studying the perturbing forces affecting on the motion of the mentioned satellites after studying the coordinate system used in the research. The most important forces studied in this chapter are:
1- The Earth's gravitational field,
2- The Moon and Sun gravitation attraction,
3- The atmospheric drag,
4- The Solar Radiation Pressure,
5- The Earth's Albedo and Infrared radiation.

In chapter 4, we give a new method for determination of drag and left with an emphasis on this instantaneous computation of the disturbing effects as accurately as possible, enabling the description of the orbital behavior of the satellite moving even within the dense layers of the upper atmosphere.

We used a formula based on a mathematical representation of the laboratory measurements to determine the drag and left coefficients C_D and C_L, also we discussed the best choice of the thermospheric model. The chapter is finalized by an example for computing the drag and lift for CHAMP and CESAR satellites.

Appendix1: describe the equations used in CIRA MODEL.

Appendix2: contain FORTRAIN code for computing the drag and lift for CHAMP and CESAR satellites.