بسم الله الرحمن الرحيم

شبكة المعلومـــــات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

﴿ قـــسـم ﴾

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 الوثائق الأصلية تالفة

بالرسالة صفحات

لم ترد بالأصـــل

Ain Shams University.
Faculty of Education.
Department of Mathematics.

ELECTROHYDRODYNAMIC KELVIN-HELMHOLTZ INSTABILITY WITH HEAT AND MASS TRANSFER

Thesis

Submitted in Partial Fulfillment of the Requirements of the Master's Degree in Teacher Preparation in Science (Applied Mathematics)

Submitted to:
The Department of Mathematics
Faculty of Education - Ain Shams University

By:
Emad Hassan Aly Farag
B.Sc & Education (Mathematics)
Ain Shams University (1994).

Under the Supervision of:
Prof. Dr. Abou Elmaged A. Mohamed
Prof. of Applied Mathematics.
Faculty of Education. Ain Shams University.

Dr. Mohamed F. Elsayed
Lecturer of Applied Mathematics.
Faculty of Education. Ain Shams University.

1999

To everyone taught me anything,
No words can express my thanks.

ACKNOWLEDGMENTS

First of all, gratitude and thanks are to ALLAH who always helps and guides us.

I am deeply grateful to my supervisor **Professor Abou El Maged A. Mohamed,** Professor of Applied Mathematics, Faculty of Education, Ain Shams University, for suggesting the problem involved in this work and for his guidance, valuable suggestions and discussions throughout his supervision of this work.

I am deeply grateful to my Co. supervisor **Dr. Mohamed F. Elsayed,** Lecturer of Applied Mathematics, Faculty of Education, Ain Shams University, for his kind help, guidance and facilities offered throughout this investigation.

I would like to acknowledge my deepest gratitude to **Dr. Yassmen D. Mahmoud,** Lecturer of Applied Mathematics, Faculty of Science, Suez Canal University, for her cooperation, helpfulness and kindness. I am also indebted to **Professor Elsayed M. ElGazzy,** Professor of Pure Mathematics, Faculty of Education, Ain Shams University for his encouragement during this research. Also, I would like to acknowledge my deepest gratitude to **Dr. Elsayed M. Elsayed,** Lecturer of Pure Mathematics, Faculty of Education, Ain Shams University for his encouragement and cooperation.

Finally, thanks are due to the chairman and the staff of the Department of Mathematics, Faculty of Education, Ain Shams University, for the facilities they kindly offered through this investigation specially **Mahmoud M. Ramadan,** Assistant Lecturer and Mr. **Mostafa Elshahed.**

Contents

Chapter (3)

Electrohydrodynamic Kelvin-Helmholtz Instability for Conducting Fluids. The Effect of Heat and Mass Transfer under a Normal Electric Field.

Appendices