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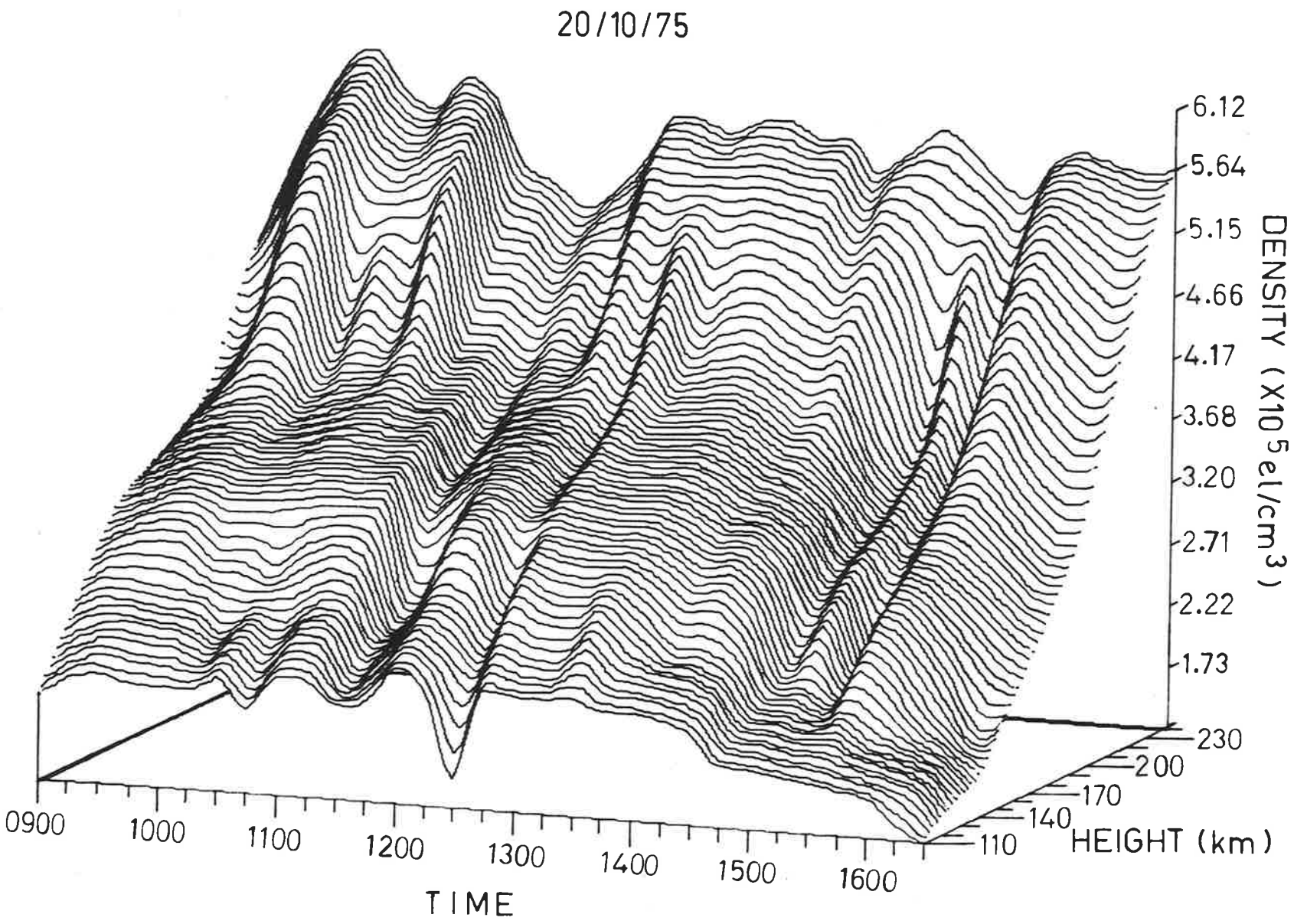
FRONTISPIECE - A three-dimensional view of the wave-like travelling ionospheric disturbances observed during the present investigations. More of these disturbances are presented in Chapter 7 (Section 7.7) of this thesis.


20/10/75
6.12
5.64
5.15
4.66
4.17
3.68
3.20
2.71
2.22
1.73
DENSITY (X10^{5}el/cm^3)
230
200
170
140
110
HEIGHT (km)
0900
1000
1100
1200
1300
1400
1500
1600
TIME

TRAVELLING IONOSPHERIC DISTURBANCES

by

MUBASHAR AHMED M.Sc. (Sind)

A Thesis

presented for the degree of

DOCTOR OF PHILOSOPHY

at the

UNIVERSITY OF ADELAIDE

(Physics Department)

APRIL 1977

Dedicated to my Father.

"*But this is an old tale you tell - they say.*
But surely this is a new tale you tell - some say.
Tell it once again - they say;
Or, do not tell it yet again - others say.
But I have heard all this before - say some;
Or, but this is not how it was told before - say the rest.
And these, these are our people, Dervish Baba, this is Man."

(Naqshbandi Recital)

from "THE WAY OF THE SUFI"
by Idries Shah.

CONTENTS

SUMMARY

This Thesis consists of three parts. The first part deals with the observations of waves and irregularities in the lower ionosphere, a theoretical background of atmospheric gravity waves and their characteristics, various methods of analysis and description and results of experiments using Phase-Path techniques.

The second part of this thesis forms the major part and represents the main project undertaken by the author. It includes an extensive literature survey, a description of the experimental arrangement, analysis, and results of observations of travelling ionospheric disturbances in the F-region.

The third part consists of the observations using Faraday rotation technique and the spectral analysis results. The effects of geomagnetic storms on the total electron content are also discussed using selected samples.

STATEMENT

To the best of the author's knowledge this thesis contains no material previously published or written by another person, except where due reference is made in the text. It contains no material which has been submitted or accepted for the award of any other degree or diploma in any university.

(M. Ahmed)

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