

**CERTAIN ASPECTS OF TROPICAL CYCLONES
AND
SPECIAL FEATURES OF MONSOON
OVER INDIAN REGION**

**BY
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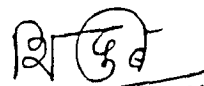
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CERTIFICATE

This is to certify that the thesis entitled "Certain aspects of Tropical Cyclones and Special features of monsoon over Indian Region" being submitted by Gurmukh Ram Gupta for the award of the degree of DOCTOR OF PHILOSOPHY, is a record of the original bonafide research work carried out by him. He has worked under our joint guidance and supervision and has fulfilled the requirements for the submission of this thesis. The results presented in this thesis have not been submitted in part or full to any other University or Institute for award of any degree/diploma.



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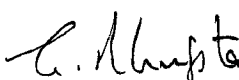
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(G.R. GUPTA)

A B S T R A C T

The contents of this thesis can be broadly divided into two parts :

- i) Certain aspects of Tropical Cyclones, and
- ii) Special features of monsoon over Indian Region

The first part deals with the estimation of maximum wind speed in Tropical Cyclones and its distribution in the cyclone field for the Indian Seas. In Chapter 2, Dvorak's table of maximum wind and pressure deficit at the cyclone centre from the T-number classification based on satellite imagery for Pacific and Atlantic oceans, have been extended for Indian Seas. The relationship is widely used for operational cyclone warning and storm surge forecasts for Indian coastline in recent years. Chapter 3 deals with certain diagnostic studies of a few tropical cyclones of pre-monsoon and post monsoon season and it brings out their peculiarities and antecedent synoptic situations. Such studies are useful in better understanding of the phenomenon and consequent improved forecasting capability.

The second part of this thesis consists of studies on monsoon rainfall. These have been dealt with in Chapter 4, while Chapter 5 deals mainly with Certain diagnostic studies of satellite imagery during pre-monsoon and monsoon months wherein an attempt has been

made to understand and relate the subsequent few days or a week's performance of monsoon. It is seen that the activity of southern hemispheric equatorial trough has inverse relationship with the monsoon rainfall over Peninsular India. This can be used in foreshadowing dry and wet spells over southern India. The location and intensity of cross equatorial flow appear to play an important role in the onset of southwest monsoon and its activity during the season. Chapter 6 deals with the inter-annual variability of monsoon which is quite large. It is seen that if drought and excess monsoon years associated with el-nino and without el-nino when put together exhibit certain interesting behaviour in the mean which may be helpful in better understanding the impact or mechanism of such phenomenon like el-nino on monsoon performance.

Most of the work presented in this thesis has been published in Mausam (formerly I.J.M.H. & G.) or Vayu Mandal. Some have been accepted for publication while a few has been submitted for publication.

We hope the work presented in this thesis will contribute to some extent in the better understanding of certain aspects of Tropical Cyclones and some special features of monsoons over Indian region and result in improved forecasting capabilities.

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