

Acoustic Remote Sensing

Proceedings of the Fifth International Symposium on Acoustic Remote Sensing of the Atmosphere and Oceans, February 1990, New Delhi, India

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Remote Sensing of the observable parameters in the earth and planetary sciences has grown in importance very rapidly in recent years and it has become one of the most powerful and important experimental techniques. It involves the measurement of the parameters of an object under study from a distance without coming in contact with the object, utilising the reflected or scattered electromagnetic or acoustic wave energy.

Acoustic probing of the atmosphere using refraction effects is not a new concept. Very early information about the temperature structure of the middle atmosphere was inferred from the anomalous propagation of the sound. However, the modern Acoustic Remote Sensing techniques have developed after the first observations of scattered acoustic signals from the low level atmospheric inversion boundary layer by Gilman and co-workers in 1946, and the subsequent extensive theoretical work on the scattered acoustic energy due to temperature, wind and humidity fluctuations of the air. After 1970 the subject has developed very fast, and has become an important tool for the study of the atmospheric boundary layer, air pollution, wind shear monitoring and turbulence studies of the atmosphere and oceans.

With the growth of techniques and increasing importance of the subject the International Society of

Acoustic Remote Sensing (ISARS) was formed in 1981 and the International Symposia on Acoustic Remote Sensing of the Atmosphere and the Oceans have been held every two years since then. The book under the review is the Proceedings of the Fifth International Symposium held at the National Physical Laboratory, New Delhi, India.

The Symposium was attended by participants from thirteen countries. Fifteen invited and fifty-one contributed papers were presented and the same are reproduced in this book. The papers have been grouped into six parts : (1) General, (2) Instrumentation and Techniques, (3) Ocean Studies, (4) Air-sea Interaction Studies, (5) Studies of the Atmospheric Boundary Layer, and (6) Applications.

Part one, General, has twelve papers, where different Remote Sensing Techniques for the study of the Atmospheric Boundary Layer and Pollution, such as acoustic, LASER, microwaves, satellite based techniques and mixed radio-acoustic systems (RASS) are described, their merits and demerits compared and discussed and the state of the art reviewed.

Part two on instrumentation and techniques has ten papers going into the details of design of instruments and data reduction algorithm development.

Part three has eight papers going into details of the ocean studies.

Part four deals with the very important topic of air-sea interaction studies. This part has eleven papers dealing with boundary layer over oceans, ocean-atmosphere energy transfer and meso-scale studies.

Part five has fourteen papers describing in detail the use of SODAR in the study of the atmospheric boundary layer.

Part six has eleven papers going into the details and the current status of applications of Acoustic Remote Sensing in pollution monitoring, air quality studies and monitoring the minor constituents in the atmosphere.

Most of the work presented is of high quality and many front line ideas and techniques are discussed. The book will be found very useful by the workers in the field and by students seeking first hand latest information in this new field of importance. Importance of the subject and the current interest in the utilisation of this technique internationally and in India is evident from the support and sponsorship the symposium

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— P. D. BHAVSAR