

PREFACE

With significant progress in microwave/mm-wave devices and system technology achieved in recent years, radiometers are increasingly used in remote sensing of various atmospheric gases that affects mm-wave propagation. Such radiometers are used as a ground based sensor and also from satellite platforms which can provide images and other forms of data about earth's atmosphere and surface. These data have great potential in solving many problems; for mm-wave LOS link designing, for weather forecasting, topographic mapping, soil moisture determination, crop mapping, flood mapping, identifying different types of sea ice as an aid to navigation in Antarctic waters. Thus, microwave radiometric sensing have become an economical means to monitor continuously the atmosphere even through snow, dust, cloud cover and darkness.

Since water vapour dominates mm-wave attenuation, ground based radiometric measurement of atmospheric water vapour is discussed in detail. The same radiometer was taken to Antarctica for water vapour measurement. Choice of radiometer operating frequencies for water vapour sensing are re-examined. Also, mm-wave window frequencies which were thought to be constant anywhere in the world are also found to be variant. Finally, a mm-wave communication system has been proposed for Antarctica.

I acknowledge my sincere thanks and gratitude to my Supervisor Prof. A.K. Sen for his unceasing willingness to share his knowledge and experience in the field and strongly motivated me to shape this work into thesis.

I also feel genuine gratitude towards Prof. A.K. Saha who has always been a source of inspiration in pursuing the work. His critical comments were specially helpful to bring this thesis into its present form. I would like to acknowledge a number of my colleagues who helped me to solve countless problems and made their presence felt in various phases of the work.

I wish to record my thanks to Mr. O.P.N. Calla and Mr. S.S. Rana of Space, Application Centre (SAC), Ahmedabad for extending valuable support to make the 22.235 GHz radiometer operational. I am thankful to Department of Ocean Development, Govt. Of India for giving me an opportunity to go to the Antarctica. Special thanks goes to all participants of XI Indian Scientific Expedition team especially Indian Army, Indian Navy and Indian Air Force personnel who provided excellent logistic support for conducting the experiments in the most hostile environment.

I am grateful to University Grants Commission (UGC), Govt. Of India for providing financial assistance during the course of research work. Finally, I express my thanks to everybody who contributed directly or indirectly to this thesis : my colleagues, for their advice and the insight which they provided; the people who took part in my Ph.D. seminar, for their puzzling and most interesting questions.

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