

Edition

BASICS OF ATMOSPHERIC SCIENCE



A. Chandrasekar

Basics of Atmospheric Science

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Intended primarily as an introductory textbook for the postgraduate students of atmospheric sciences, geophysics, and meteorology, this book would also be extremely useful to all those engaged in meteorological research. The book, comprising fifteen chapters, provides a detailed treatment of various aspects of atmospheric phenomena and their underlying physical principles. It offers a study of both physical and dynamical aspects of the atmosphere. After discussing the fundamental processes such as origin of the atmosphere, atmospheric thermodynamics, atmospheric radiation and cloud and precipitation formation, the book focuses on equipping students with a thorough understanding of weather and climate. The book also deals with large-scale systems such as waves and synoptic disturbances in lower and mid-altitudes. Global energy balance, general circulation, numerical modelling and chaos in the atmosphere are all well covered in great detail.

The book also provides eighty-four worked-out problems and four FORTRAN programs to solve the nondivergent vorticity equation, the shallow water equation as well as the numerical solution of the forced damped pendulum and that of the Lorenz system. Execution of these computer programs will enable the students to understand concepts such as convergence, stability and issues of choosing the necessary step size in space and time, respectively.

THE AUTHOR

A. CHANDRASEKAR, Ph.D., is Senior Professor and Head, Department of Earth and Space Sciences, Indian Institute of Space Science and Technology Thiruvananthapuram. Earlier, he has been Professor of Physics and Meteorology and Head of Centre of Oceans, Rivers, Atmosphere and Land Sciences at Indian Institute of Technology Kharagpur, where he served for 21 years. Professor Chandrasekar has taught a variety of undergraduate and postgraduate courses during his long teaching and research career of nearly 22 years. He has to his credit about 40 peer reviewed journal publications. He is also a member of the Editorial Boards of the *The Open Atmospheric Science Journal* and *Disaster Advances Journal*, besides being a member of the National Academy of Sciences, India and a life member of the Indian Meteorological Society and Indian Society for Theoretical and Applied Mechanics.

His fields of specialization are atmospheric modelling, mesoscale modelling and data assimilation.

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