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Radiation and Climate, by J.M. Vardavas & T.W. Taylor, 2007.
Oxford Scientific Publications, Great Clarendon Street, Oxford, OX2
6DP, United Kingdom. Hardback, 492 pages. Price GBP 65.00. ISBN
987-0-19-922747-1.



This is, in short, an excellent book, very well suited as a text book. After a review of the climate system, it describes atmospheric physics, notably the thermodynamics of atmospheric processes and radiation transfer theory. It discusses the incoming solar radiation, its transfer through the atmosphere, with a distinct chapter devoted to the transfer of infrared radiation. It is followed by a chapter on atmospheric photochemistry and a long one, devoted to the Earth's radiation budget. These constitute the first and most important part of the book. Thereafter follow the theory of radiation measurements and a chapter on climate observation by radiometry and spectroscopy. The book concludes with a chapter on climate modelling (very useful) and one on planetary evolution and comparative climatology that could, as to this reviewer, as well have been omitted. Likewise, a discussion of the evolution and structure of solar-type stars seems a bit too far from the actual theme of the book.

Some modest criticism is that the book is in some respects restrictively devoted to theory. An example is the chapter on the theory of radiation measurements, where really only the mathematical theory of the instruments is given. One would like to see, at least in a few examples, how these instruments are actually constructed and how they operate. A similar problem refers to subsection 10.7 (Atmospheric temperature: HIRS and AIRS – why only these two instruments?) where, among other things, a nice diagram shows the pressure-dependent weighting functions for some of the channels of the AIRS instrument. One would be eager to see an example of temperature measurements obtained by this experiment, followed by a comparison with actual observations. Briefly, the authors have at some places, not at all, carefully stayed away from the real atmosphere. In the reviewer's opinion an, albeit brief, comparison of observations with theory is more useful than remote subjects such as the last chapter on planetary atmospheres and the discussion of the evolution of solar-type stars.

Apart from that: a good book. It concludes with some useful tables, mainly devoted to the chemical reactions in the atmosphere.

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