Essentially, it may be said that the authors consider two related types of problems which have been of interest in recent research. The first is to find "domination" theorems. Thus if $S, T\colon X \to Y$ are positive operators and $S \leqslant T$ then one seeks to determine properties of S from those of T. This line was initiated in an important paper of Dodds and Fremlin in 1979, who showed that if Y and the dual of X have order-continuous norms and if T is compact then S is also compact. Since this paper there have been a number of ramifications of this general theme. The underlying idea is to prove, under suitable hypotheses, that S can be approximated by operators in the ideal generated by T.

The second type of question revolves around factorization theorems. A very useful result of Davis, Figiel, Johnson, and Pełczyński in general Banach space theory asserts that a weakly compact operator between two Banach spaces can be factored through a reflexive space. The analogue for positive operators and Banach lattices is false, as was shown by a recent counterexample due to Talagrand. Unfortunately, Talagrand's example is not presented in the book (although it is mentioned), perhaps because it appeared too late for inclusion. Nevertheless, there are a number of factorization results available and the authors emphasize their use. A typical example is a result, due to Aliprantis and Burkinshaw, that a product of two positive weakly compact operators can be factored positively through a reflexive Banach lattice. Theorems of this type and their relatives can be used to establish domination-type results.

The cycle of ideas represented in the final two chapters closely follows the research interests of the authors over the last few years, and many of the results are due to them. It seems to the reviewer that these problems are now well understood, and most of the results are in the best possible form.

In general, this is a careful and well-written account of certain aspects of positive operators. It is clearly not and was not intended to be a complete treatment; the reader is given an introduction to some specific parts of the general theory. For a more complete understanding of all the current trends one should also consult the works of Schaefer and Zaanen.

References

1. H. H. Schaefer, *Banach lattices and positive operators*, Springer-Verlag, Berlin and New York, 1974.

2. A. C. Zaanen, *Riesz spaces*. II, North-Holland, Amsterdam, 1983.

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On the Cauchy problem, by Sigeru Mizohata, Science Press, Beijing, and Academic Press, Orlando, 1985, 177 pp., $36.00 (paper). ISBN 0-12-501660-3

The theory of partial differential equations has as its source the study of a few model problems, many of them arising in physical applications. Laplace's equation and the wave and heat equations are prototypical, and the traditional