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## PREFACE

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The Fifth Conference on Domain Decomposition Methods for Partial Differential Equations was held in Norfolk, Virginia, from May 6 to May 8, 1991. The conference was efficiently organized by SIAM and conducted with the partial support of the National Science Foundation. A truly international contingent numbering approximately 120 assembled for the meeting, which featured some 70 presentations. Previous conferences in this series have been held in France, the United States, and the Soviet Union; the most recent conference was held in Como, Italy, in June 1992.

One of the important themes of the conference continues to be the role of domain decomposition in the effective utilization of parallel systems. The technique provides a natural mechanism for dividing a problem among the processors in such a way that most of the work can be done independently on each processor with periodic sharing of data across the boundaries of the domains. The means of advancement of the boundary data is critical and remains one of the exciting areas of active research.

On the theoretical side, analysis of elliptic equations has matured, with attention now focused on difficult issues such as non-selfadjoint problems. The past year has also seen increased emphasis on hyperbolic, parabolic, and mixed equations.

Reflecting the fact that many domain decomposition techniques have grown out of the necessity to solve challenging problems from science and engineering, the conference continues to have a significant fraction of the papers devoted to applications. In addition, as the techniques have become more sophisticated and as their range of applicability has become better understood, the complexity and range of the applications has increased. This is manifested by papers from fluid mechanics, structures, biology, and design optimization.

We have organized the volume into four sections according to the main emphasis of each paper: Theory, Algorithms, Parallel Implementation, and Applications. Most of the presentations are included in these proceedings. Where we were unable to obtain a paper, we have inserted its abstract. In a few cases, the proceedings paper has been accepted for publication in a journal and we include an appropriate reference to the complete paper.

It is our hope that the publication of these proceedings will stimulate further research on this exciting subject.

David E. Keyes  
Tony F. Chan  
G rard Meurant  
Jeffrey S. Scroggs  
Robert G. Voigt