

## Preface

The First International Symposium on Domain Decomposition Methods for Partial Differential Equations took place at Ecole Nationale des Ponts et Chaussées, Paris, France on January 7-9, 1987. The location of the symposium was appropriate since a number of scientific giants (Cauchy, Navier, and Saint-Venant) have been associated with the school. The meeting was attended by about 160 people, including 24 speakers; there were even more interested people who could not participate due to lack of space.

One of the motivations for organizing this conference was the growing popularity of decomposition methods over the last few years, mainly due to the strong emergence of multiprocessor, array, and parallel computers. A second motivation was the need to split very large scale problems into smaller ones in order to solve them. If a Journal for Domain Decomposition Methods and their Applications were created now, we believe it would be quite successful and there would be little difficulty in finding good papers to publish.

Domain decomposition methods are actually not new; the Schwarz alternating method (discussed in the first paper of this volume) is already more than one century old. Substructuring and block iteration methods are not new either, and also can be viewed as domain decomposition techniques.

These proceedings consist of 22 papers ranging in topic from the theoretical foundations of domain decomposition methods and the mathematical theory of their approximations, to their application to the solution of complicated problems in structural and fluid mechanics. An analysis of related techniques, such as block relaxation and element by element methods and their applications, has been included. Another important issue present in these proceedings is the computer implementation of the above techniques, particularly their vectorization and parallelization.

These proceedings are very likely the first English-language volume totally dedicated to domain decomposition methods; yet from the impressive activity in this field presently taking place in the United

States, Western Europe, U.S.S.R., and Japan, we can expect more to come. The Second International Symposium on Domain Decomposition Methods will take place in Los Angeles, California on January 14-16, 1988.

We would like to acknowledge the support of various institutions and organizations, particularly AMD/BA, CEA, DRET, EDF, ENSPC, GAMNI, INRIA, LCPC, ONR, SIAM, and also those individuals whose contributions have been essential to the success of the First International Symposium on Domain Decomposition Methods for Partial Differential Equations.

November 1987

Roland Glowinski  
INRIA and University of Houston

Gene H. Golub  
Stanford University

G rard A. Meurant  
Centre d'Etudes de Limeil-Valenton

Jacques P riaux  
AMD/BA and INRIA