The Development and Evaluation of Numerical Algorithms for MIMD Computers

Two activities were pursued under this grant. The first was a visitor program to conduct research on numerical algorithms for MIMD computers. The program is summarized in the following attachments. Attachment A - List of Researchers Supported; Attachment B - List of Reports Completed; and Attachment C - Reports. The second activity was a workshop on the Control of Fluid Dynamic Systems held on March 28-29, 1989. The workshop is summarized in attachments. Attachment D - Workshop Summary; and Attachment E - List of Workshop Participants.
THE DEVELOPMENT AND EVALUATION OF NUMERICAL ALGORITHMS FOR MIMD COMPUTERS

Final Report for Grant No. AFOSR-88-0117

Covering the period

February 1, 1988 through January 31, 1990

Submitted by:

Robert G. Voigt

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IN SCIENCE AND ENGINEERING
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Hampton, Virginia 23665
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Attachment A - List of Researchers Supported
Attachment B - List of Reports Completed
Attachment C - Reports

The second activity was a workshop on the Control of Fluid Dynamic Systems held on March 28-29, 1989. The workshop is summarized in attachments.

Attachment D - Workshop Summary
Attachment E - List of Workshop Participants
Attachment A

List of Researchers Supported

Loyce Adams - University of Washington
Mark Jones - Duke University
David Keyes - Yale University
Charles Koelbel - Purdue University
Richard Littlefield - University of Washington
Piyush Mehrotra - Purdue University
David Nicol - College of William and Mary
Merrell Patrick - Duke University
Terrence Pratt - University of Virginia
Joel Saltz - Yale University
Paul Saylor - University of Illinois
Attachment B
List of Reports Completed

NAS1-18605, AFOSR 88-0117

NAS1-18107, AFOSR 88-0117

NAS1-18107, NAS1-18605, AFOSR 88-0117

NAS1-18107, NAS1-18605, AFOSR-88-0117, 6/87 to 10/88

NAS1-18605, AFOSR-88-0117, November 1988 to April 1989

NAS1-18605, AFOSR-88-0117

NAS1-18107, NAS1-18605, AFOSR-88-0117, T/11, w/o 10

NAS1-18107, NAS1-18605, AFOSR-88-0117, w/o 22
Complete reports are available if requested.
Attachment D

Summary of Workshop on Control/Fluid Dynamics Systems
WORKSHOP ON CONTROL OF FLUID DYNAMIC SYSTEMS

There is a growing belief that developments in fluid dynamics, control theory and the computational sciences make it feasible to consider opportunities in the active control of fluid phenomena such as the transition to turbulence. Many problems still lie beyond present understanding and capability, but it seems appropriate to mount a research activity geared at exposing those problems on which some progress might be made and at illuminating those areas that require further development. To this end, ICASE organized a workshop held at the Radisson Hotel in Hampton, Virginia on March 28-29, 1988.

The participants of the workshop are listed in Appendix A and the Agenda is given in Appendix B. The initial lecture, given by J. McMichael, presented some areas of fluid dynamics that would benefit from active control. Three additional lectures were given presenting overviews of the state of the art in computational fluid dynamics, control of distributed parameter systems and the mathematical theory of the Navier-Stokes equations. Presentation material from these lectures is included in Appendix C.

Following discussion, three problems were identified for closer study: controlling the boundary between two fluids to enhance mixing, flutter suppression, and tangential blowing across a delta wing to affect leading edge separation. Workshop attendees were divided into three groups. Each group was asked to consider one of the problems and to lead a discussion when the workshop reconvened as a whole. Presentation material for these discussions is contained in Appendix D.
Attachment E

List of Workshop Participants
LIST OF ATTENDEES
WORKSHOP ON CONTROL OF FLUID DYNAMIC SYSTEMS
March 28-29, 1988

Professor H. T. Banks
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Professor Po Chow
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