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1A: CFD Applications for NASA's Space Exploration Mission

An Overview of CFD Applications to Space Exploration	Eugene Tu
CFD for Shuttle Development and Operation	Reynaoldo Gomez
CFD for Exploration Vehicle Development: Ares I & V, and Launch Environment	Cetin Kiris
CFD for Exploration Vehicle Development: CEV Aero-thermal Environment	Joseph Olejniczak

1B: Unstructured / Overset Grid Methods

An Overset Unstructured Grid Method For Parallel Solvers	Hasan Akay, R. Payli, J. Liu, Akin Ecer
Parallel Performance of ADPDIS3D - A High Order Multiblock Overlapping Grid Solver for Hypersonic Turbulence	Bjorn Sjogreen, Helen Yee, M. Jahed Djomehri, Art Lazanoff, William Henshaw
Efficiency enhancement of an unstructured CFD-Code on distributed computing systems	Thomas Alrutz, Christian Simmendinger, Thomas Gerhold
Parallel Poisson Solver for Revolved Unstructured Grids. DNS of the flow around a sphere at Re = 3700	Ricard Borell, O. Lehmkuhl, I. Rodriguez, C. Perez Segarra, A. Oliva

1C: Turbulence

Three-Dimensional Parallel Adaptive Mesh Refinement Simulations of Shock-Driven Turbulent Mixing in Plane and Converging Geometries	Manuel Lombardini, Ralf Deiterding
Large scale simulation of turbulence using a hybrid spectral/finite difference solver	Julien Bodart, L. Joly, J. Cazalbou
Turbulent flow around a wall-mounted cube: direct numerical simulation and regularization modelling	Xavier Trias, A. Gorobets, R. Verstappen, M. Soria, A. Oliva
Parallel Simulation of Turbulent Flow Inside an Aspiration Chamber Using Fluent Software	V. Zoria, P. Strodtbeck, James McDonough, K. Logachev

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2A: Parallel CFD in Ship Aero and Hydrodynamics

On the Parallelization of Particle Finite Element Method	Pooyan Dadvand, Riccardo Rossi, Eugenio Onate
Large Scale Parallel Computing and Scalability Study for Surface Combatant Static Maneuver and Straight Ahead Conditions using CFDShip-Iowa	Frederick Stern, Shanti Bhushan, Pablo Carrica, Jianming Yang
Soroban-Grid CIP Method for Ocean Research and Ship Design - High Performance Computing with Earth Simulator	Takashi Yabe, Youichi Ogata, Takeshi Sugimura, Kenji Takizawa, Keiko Takahashi
A Parallel Hybrid Finite Element/Volume Methods for Ship Hydrodynamics	Shahrouz Aliabadi, Tian Wan, Christopher Bigler

2B: Mechanical / Aerospace Engineering Applications I

Optimization of Synthetic Jet Parameters over an Elliptical Profile Using Response Surface Methodology	Engin Erler, Ismail Tuncer, Myhong Sohn
Program Complex For 3D Simulation Of Gas Flow And Radiative Heat Transfer	Boris Chetverushkin, S. Polyakov, T. Kudryashova, A. Sverdlin, A. Kononov
Parallel Time-Accurate Computations of Dynamic Derivatives	Jubaraj Sahu
Aerodynamic Database Generation Using Surrogate Model-Based Adaptive Sampling and Automated Mesh Refinement	Andrea Nelson, Matthew McMullen

2C: Parallel Algorithms / Solvers I

Parallel implementation of the adaptive Aitken-Schwarz method for non separable operator	Thomas Dufaud, Damien Tromeur-Dervout
Understanding the Performance of Hybrid MPI/OpenMP Programming Model for Implicit CFD Codes	Dinesh Kaushik, Satish Balay, David Keyes, Barry Smith
On a parallel implementation of the BDDC method and its application to the Stokes problem	Jakub Sistek, P. Burda, J. Mandel, J. Novotny, B. Sousedik
Enabling temporal blocking for a lattice Boltzmann flow solver through multicore-aware wavefront parallelization	Johannes Habich, T. Zeiser, G. Hager, Gerhard Wellein

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3A: CFD on the World's Four Fastest Supercomputers

Adapting the CFDNS Compressible Navier-Stokes Solver to the Roadrunner Hybrid Supercomputer	Jamal Mohd-Yusof, Daniel Livescu
Large Eddy Simulation of Turbulence-Chemistry Interactions in Reacting Flows: Experiences on the ORNL NCCS Cray-XT Platforms (Jaguar)	Joseph Oefelein, Ramanan Sankaran
Large Scale Aerodynamic Calculation on Pleiades	Thomas Pulliam, Dennis Jespersen
On the Performance of the Miranda CFD code on Multicore Architectures	Martin Schulz, Andrew Cook, William Cabot, Bronis de Supinski, William Krauss

3B: Acoustics and Combustion

Computational Aeroacoustics of a Supersonic Jet Impinging on an Inclined Flat Plate Using High Speed Parallel Computers	Taku Nonomura, Yoshinori Goto, Kozo Fujii
Parallel simulations of acoustic wave propagation in a 3-D spherical model of the sun	Thomas Hartlep, Nagi Mansour, J. Zhao, A. Kosovichev
Parallel Adaptive Simulation of Weak and Strong Transverse-Wave Structures in H2-O2 Detonations	Ralf Deiterding
A Study on Combustion Flow Dynamics by High-Fidelity Numerical Simulation	Junji Shinjo, Shingo Matsuyama, Yasuhiro Mizobuchi, Naoyuki Fujita, Ryoji Takaki, Yuichi Matsuo

3C: Parallel Algorithms / Solvers II

A Parallel Free Surface Lattice Boltzmann Method for Large-Scale Applications	Stefan Donath, Christian Feichtinger, Thomas Pohl, Jan Goetz, Ulrich Ruede
A framework for parallel flow computation with multi-box layout	Kenji Ono, Takashi Michikawa, Tsuyoshi Tamaki, Osamu Hiramoto
Parallel performance of the Deflated Conjugate Gradient	Romain Aubry, G. Houzeaux, M. Vazquez
Integrated Hurricane and Overland Flow Modeling in Parallel Platform	Muhammad Akbar Shahrouz Aliabadi

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4A: Parallel CFD: Performance and Scaling Tools

Performance Tools and Engineering - An Overview	David Cronk
Performance Evaluation of Multi-Language CFD Applications using TAU	Sameer Shende
Parallel Performance Evaluation of Helios	Andrew Wissink
Analyzing the Performance of Scientific Applications with Open SpeedShop	Jim Galarowicz, Martin Schulz

4B: Mechanical / Aerospace Engineering Applications II

Numerical Drag Reduction Studies of Generic Truck Models Using Active Flow Control	Miles Bellman, Jonathan Naber, Ramesh Agarwal
A hybrid CPU/GPU parallel algorithm for coupled Eulerian and Vortex Particle Methods	Christopher Stone, Christopher Hennes, Earl Duque
Flow Modeling of Projectile Using Overset Flow Solver	Erdal Yilmaz, Shahrouz Aliabadi
Exploring Discretization Error in Simulation-Based Aerodynamic Databases	Michael Aftosmis, Marian Nemec

4C: Design Optimization

Efficient parallel algorithm for aerodynamic design of wing-body-junction driven by accurate Navier-Stokes computations	Sergey Peigin, B. Epstein
Parallel performance of CFD applications and the ubiquitous need for HPC with high fidelity, multidisciplinary analysis and optimization (MDO)	Mark Kremenetsky, Srinivas Kodiyalam
Adjoint-Based Adaptive Meshing and Shape Optimization in a Parallel Setting	Marshall Gusman, Jeff Housman, Cetin Kiris
Parametric Co-Optimization of Lifting Blunt Body Vehicle Concepts for Atmospheric Entry	Joseph Garcia, James Brown, David Kinney, Jeffrey Bowles

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5A: Enabling Computationally Based Acquisition Engineering of Aeronautical Defense Systems

CBE Product for Multi-Physics Test and Analysis of Rotorcraft	Venke Sankaran
Kestrel A Fixed Wing Virtual Aircraft Product of the CREATE Program	Scott Morton, David McDaniel, David Sears, Brett Tillman, Todd Tuckey
Enabling CBE Relevance in Early-Phase Acquisition Engineering	Greg Roth
CBE Product for Airframe-Propulsion Integration	Robert Nichols

5B: Large-Scale Application Scaling

Optimization of communications in CFD and CAA modeling using modern supercomputers with extreme numbers of CPU cores	Boris Chetverushkin, Sergey Soukov, Andrey Gorobets, Tatiana Kozubskaya
Performance of CFD Applications on NASA Supercomputers	Jahed Djomehri, Dennis Jespersen, James Taft, Henry Jin, Robert Hood, Piyush Mehrotra
General Performance Optimizations for Several Unstructured Mesh CFD codes on Modern HPC Systems	James Taft
Scaling CFD Applications to 100,000 Cores and Beyond on IBM Systems	Jeffrey M. Fier, Jeff Zais

5C: CFD on GPUs

Acceleration of a CFD Code with a GPU	Dennis Jespersen
Application of a Kinetic Theory based solver of the Euler Equations using GPU	Matthew Smith, Fang-An Kuo. Chau-Yi Chou, Jong-Shinn Wu
A Fast Double Precision CFD Code using CUDA	Jonathan Cohen, Jeroen Molemaker
Heterogeneous Parallelism of High-Order Residual Distribution Schemes Using Central and Graphics Processing Units	Stephen Guzik, Clinton Groth

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6A: Parallel and Meshfree: New Frontiers of CFD

Parallel Implementation of Panel-Free Boundary Conditions for the Vortex Particle Method	Felipe Cruz, Christopher Cooper, Rio Yokota, Lorena Barba
DNS of Homogeneous Turbulence Using Vortex Methods Accelerated by the FMM on a Cluster of GPUs	Rio Yokota, Tetsu Narumi, Ryuji Sakamaki, Shun Kameoka, Kenji Yasuoka, Shinnosuke Obi
A Hybrid OpenMP-MPI Approach for Smoothed Particle Hydrodynamics	Charles Moulinec, R. Issa, D. Latino, P. Vezolle, David Emerson, X. Gu
TBA	TBA

6B: Parallel Software Development

Report on the development of an generic discontinuous Galerkin framework in .NET	Florian Kummer
Porting to Cell/B.E. the Alya System, a High Performance Computational Mechanics Code	R. de la Cruz, M. Araya-Polo, Mariano Vazquez, G. Houzeaux, M. Jowkar, J. Cela
Using XML with Large Parallel Datasets: Is There Any Hope?	Renato Elias, Vanessa Braganholo, Jerry Clarke, Marta Mattoso, Alvaro Coutinho
Accelerating Clean Coal Gasifier Designs with Hybrid MPI/OpenMP High Performance Computing	Aytekin Gel, S. Pannala, R. Sankaran, C. Guenther, M. Syamlal, T. O'Brien

6C: Other Applications

Numerical modelling of nonequilibrium driven cavity gas flow with a higher order moment approach	Xiao-Jun Gu, David Emerson, Gui-Hua Tang, Charles Moulinec
Simulation of the climate of the XX century in the Alpine space: numerical tests on NEC SX-9 supercomputer	Edoardo Bucchignani, R. Mella, P. Mercogliano, P. Schiano
Blood Cell Dynamics in a Simple Shear Flow using an Implicit Fluid-Structure Interaction Method Based on the ALE Approach	Choengryul Choi, Changnyung Kim
Numerical Simulations of Scattering of Magnetoacoustic Waves by Sunspots	Konstantin Parchevsky, A. Kosovichev

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