




CAIRO UNIVERSITY

The background of the cover is a photograph of the Great Pyramids of Giza and the Great Sphinx in Egypt. The Sphinx is in the foreground on the right, and the Great Pyramid is on the left. The sky is blue with some clouds.

**THE INTERNATIONAL CONGRESS
ON
FLUID DYNAMICS
AND PROPULSION (ICFDP 7)**

December 18 - 20, 2001

Cairo - Egypt

Seventh
International Congress
on
Fluid Dynamics and
Propulsion

December 18-20, 2001
Cairo, Egypt

Organized by :
The American Society of
Mechanical Engineers
and
Cairo University



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and
Cairo University**

Honorary Chairmen

- 1. Egyptian Minister of Petroleum:
Eng. Sameh Samir Fahmi**
- 2. Egyptian Minister of Electricity
and Energy:
Dr. Hassan Younis**
- 3. President of Cairo University:
Prof. Dr. Naguib El-Helaly Gohar**

Executive Council

Prof. Amin Mobarak
General Conference Chairman
Mechanical Power Dept., Faculty
of Engineering
Cairo University
12211 Giza, Egypt
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Prof. Awatef Hamed
Co-Chair
ASME Fellow
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Cincinnati, Ohio 45221-0070, USA
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Prof. Magdy Abou Rayan
General Conference Secretary
Faculty of Engineering, Mansoura
University
35516 – El-Mansoura, Egypt
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Preface

The International congress of fluid dynamics and propulsion is co-organized by the American society of Mechanical Engineers and Cairo university. The objective of the conference is to bring together researchers in the fluid dynamics and propulsion areas for exchange of ideas to foster further development in the field.

The conference congregates are expected to be over 400 delegates coming from all over the world mostly scientists and educators with primary interest in the fluid dynamics and propulsion areas. A large number of papers are to be presented from all over the world.

Researchers and scientists will benefit out from exchange of their ideas and from finding out about application problems. Managers, manufacturers, designers, and graduate students will benefit from discussing the latest development in the field.

Contents

	Page
Scientific Committee	6
Local Organizing Committee	8
Introduction	9
Conference Hotel	11
Accommodation	11
Tour Programs	12
Registration & Information Desk	16
Technical Program	19
Authors & Their Sessions	40
Session Chairs	46

Scientific Committee

- Prof. H. Atassi, Univ. of Notre Dame, USA
- Prof. M. Dunn, Ohio State University, USA
- Prof. M. Gad-el-Hak, Univ. of Notre Dame, USA
- Prof. A. Ghoneim, MIT, USA
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- Prof. Y. Hussaini, Florida State Univ., USA
- Prof. M. Ibrahim, Cleveland State Univ., USA
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- Prof. O. Kandil, Old Dominion U., USA
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- Dr. A. Kumar, NASA Langley RC, USA
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- Prof. E. Michaelides, Tulane Univ., USA
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- Prof. J. Iwamoto, Tokyo Denki University, Japan

- Prof. K. Papailiou, National Tech. U. of Athens, Greece
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- Dr. R. Rivir, Wright Lab., USA
- Prof. W. Tabakoff, Univ. of Cincinnati, USA
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- Prof. D. Stock, Washington State Univ., USA
- Prof. C. Tam, Florida State Univ., USA
- Dr. G. Roy, ONR, USA
- Prof. Rautenberg, Univ. of Hannover, Germany
- Prof. M. Shoukry, McMaster Univ., Canada

Executive Local Organizing Committee

Chair

Prof. Dr. Osama Elbahar
Mechanical Power Department
Faculty of Engineering
Cairo University, 12211 Giza, Egypt
Tel.: 202 570 9080
Fax: 202 570 9080
e-mail: oelbahar@link.net

Committee

- **Prof. Osama Elbahar, Cairo University (Chair)**
- **Prof. Amr Serag Eldin, Cairo University**
- **Prof. Hazem Haikel, Helwan University**
- **Prof. Galal Khalfallah, Cairo University**
- **Prof. Saher Kossa, Cairo University**
- **Prof. Atef O. Sherif, Cairo University**
- **Dr. Atef Khalil, Cairo University**
- **Dr. Ashraf Sabry, Cairo University**
- **Dr. Abdel Naby Ahmed Cairo University**
- **Ms. Hoda Elshennawy, Cairo University**
- **Ms. Dalia Sakr, AUC**
- **Mr. Adnan Abdel Fatah, Cairo University**

INTRODUCTION

VENUE:

The conference and sessions will be held at the Meridien Cairo Hotel.

DEADLINES:

Sept. 31, Full Manuscript due for the review process.

BANKS & CURRENCY EXCHANGE:

Banks opening hours are 8:30 to 13:30, Sunday to Thursday. Most hotels and exchange offices are open over an extended period.

The official currency is the Egyptian Pound which is divided into 100 piasters. A bank is available in the hotel for 24 hours.

CREDIT CARDS:

Major Credit Cards are accepted at Hotel, but for registration, it is Master Card & Visa Only.

TEMPREATURE:

Weather in Cairo is nearly warm during December, average Temp. 20-25.

USEFUL PHONE NUMBERS:

Ambulance 121

Police 122

Fire Department 125

Telephone Directory 140, 141

HOSPITALS:

**Alsalam International, El-Cornich
Road, Madi.**

**Bedrawy, El-Cornich Road,
Madi.**

**The New Kasr-El-Aini, KasrEl-Aini
Road, downtown, Cairo.**

CONFERENCE HOTEL

Meridien Cairo

Corniche El Nil

P.O.Box 2288 Garden City

Cairo Egypt

Tel.: 202 362 1717

Fax: 202 368 6668

**Logistics: Dr. Atef Khalil
(A map of the conference rooms
is at the end of this document)**

ACCOMMODATION:

Meridien Cairo

**\$ 65.00 per single room bed and
buffet Breakfast**

**\$ 39.00 per person in double bed
& buffet breakfast.**

TRANSFERS:

Cairo airport/hotel or V.V.

1 person \$ 25.00 per person

2-5 persons \$ 15.00 per person

6-10 persons \$ 12.00 per person

**The above prices include the
including the following:**

**Meet & assist through customs &
passport formalities.**

**Transfer in air conditioned limo or
van to your hotel portage.**

**PRE AND POST CONFERENCE
TOURS:**

CAIRO:

- Pyramids & Sphinx 18 &
21/12/2001

\$ 25.00 per person

- Memphis & Sakarra 18 &
21/12/2001 \$ 25.00 per person.

- Egyptian Museum 18 &
21/12/2001

\$ 25.00 per person.

- Citadel & Khan El Khalili Bazaar
18 & 21/12/2001 \$ 25.00 per
person.

**CRUISE LUXOR/ASWAN 23-
27/12/2001:**

- \$ 770.00 per person in Double.

- \$ 870.00 per single.

The above price includes the
following:

- Transfers in cairo, Luxor &
Aswan.

- Sightseeing in Luxor (Karnak &
Luxor Temple), Edfu Temple,
Kom Ombo Temple (Philea
Temple, Unfinished Obelisk &
High Dam in Aswan).

- **04 nights full board starting with lunch & ending with breakfast.**
- **Airfare Cairo/Aswan - Luxor/Cairo University.**

**3 NIGHTS CRUISE
ASWAN/LUXOR 15-18/12/2001:**

- **\$ 575.00 per person in Double.**
- **\$ 650.00 per single.**

The above prices include:

- **Transfers in Cairo, Luxor & Aswan.**
- **Sightseeing in Luxor (Karnak & Luxor Temple), Edfu Temple, Kom Ombo Temple (Philea Temple, Unfinished Obelisk & High Dam in Aswan).**
- **3 nights full board starting with lunch & ending with breakfast**
- **Airfare Cairo/Aswan - Luxor/Cairo.**
- **The program sight change from Aswan/Luxor or Luxor/Aswan, but all sights will be included.**

**SHARM EL SHEIKH 22-
25/12/2001:**

- **\$ 460.00 per person in Double.**

- \$ 520.00 per single.

The above prices include the following:

- Transfers in Cairo Sharm El Sheikh.
- 03 nights B/B in 5 stars hotel
- Airfare, in case of case of any increase it will be applied automatically.

Payment Condition:

Payment of services should be done in full to Pioneer Events by:

- Draft Check:

Payable to Pioneer Events with total amount + \$ 20.00 Bank Charges.

Bank Transfer:

To account no. 6314180 Mibank Merghany branch, 95D Merghany Street Heliopolis Cairo Egypt. Tel.: 202 418 8102 Fax: 202 418 8107

Swift: MIBEGCX008

(Please fax copy of bank transfer to ++202 402 0609)

Please add \$ 20 on the total amount as bank charges.

Credit Card:

**By Master Card or Visa Card,
Please fax us copy of both sides
of credit card with your signature
authorizing us to charge the
amount +4% mail order charges.**

Cancellation Policy:

**Till Nov. 25, 2001 No cancellation
fees will be applied.**

**After Nov. 25, 2001 25% of total
amount will be deducted & 75%
refunded.**

**No show will be charged 100%
cancellation fees.**

**For further information or details,
please contact:**

Pioneer Events

Attn.: Mr. Nader Sami

29 Ibn Hanbal Street

Nasr City 11471 Cairo Egypt

**Tel.: ++202 404 6672 - ++202 405
1815**

Fax: ++202 402 0609

e-mail: pioneerev@hotmail.com

REGISTRATION & INFORMATION DESK

Coordinator: Dr. Ashraf Sabry

Registration fee is US\$ 300. The fee should be sent via check or Telegraphic Transfer directly to Mohandes Bank, account # 17106/2, Cairo University Branch, Cairo, Egypt.

On site registration fee by cash or checks or major credit cards is accepted. The fee covers conference CD, coffee breaks, refreshments, lunch for the three days of the conference, and banquet Thursday, December 20, 2001.

Registration Hours at the Meridien Cairo Hotel:

Tuesday, December 18, 5:00 – 8:00 PM and December 19, all day long.

Reception: December 18, 7:00 – 9:00.

Wednesday, December 19, 8:00 AM – 5:45 PM.

Thursday, December 20, 9:00 AM – 5:45 PM.

Conference Banquet, December 20, 8:00 PM.

General Program

Tuesday, December 18, 2001

5:00 PM – 8:00 PM
Registration

07:00 PM – 09:00 PM
Reception (Tabla 3)

Wednesday December 19, 2001

08:00 AM – 3:00 PM
Registration

09:00 AM - 10:45 AM
Opening Ceremony
(Palm D'or)

10:45 AM - 11:00 AM
Coffee Break

11:00 AM - 12:45 PM
Sessions (A1, B1, C1)

12:45 PM - 02:00 PM
Lunch (Brasserie)

02:00 PM - 03:45 PM
Sessions (A2, B2, C2)

**03:45 PM - 04:00 PM
Break**

**04:00 PM - 05:45 PM
Sessions (A3, B3, C3)**

Thursday December 20, 2001

**09:00 AM - 10:45 AM
Sessions (A4, B4, C4)**

**10:45 AM - 11:00 AM
Coffee Break**

**11:00 AM - 12:45 PM
Sessions (A5, B5, C5)**

**12:45 PM - 02:00 PM
Lunch (Brasserie)**

**02:00 PM - 03:45 PM
Sessions (A6, B6)**

**02:15 PM - 04:00 PM
Panel Discussion on
the Future of Natural
Gas in Egypt
(Palm D'or)**

**03:45 PM - 04:00 PM
Break**

**04:00 PM - 05:45 PM
Sessions (A7, B7)**

**08:00 PM
Conference Banquette**

Technical Program

Wednesday, December 19, 2001

Session A1: High-Speed Flow

Chairs

M. Fouad, J. Iwamoto

Room: Taba 1,2

11:00 AM

A. Kimura and J. Iwamoto

A Study on High-Speed Pulsating Jet

11:25 AM

N. Morita and T. Yokomizo

**Deviation of Underexpansion Sonic
Flow near the Wall**

11:50 AM

L. A. Bazyma and V. M. Rashkovan

**On Numerical Simulation of
Supersonic Flow using Bow-Shock-
Fitting Technique**

12:15 PM

T. Mengistu and W. Ghaly

**A Geometric Representation of
Airfoils using NURBS**

**Wednesday, December 19, 2001
Session B1: Computational and
Experimental Fluid Dynamics (I)
Chairs**

**C. Kato, S. Mourad
Room: Tab 3**

11:00 AM

N. H. Mostafa

Computed Flow Around Ship Spoiler

11:25 AM

M. E. Ali, F. Al-Youssef

**Laminar Mixed Convection Boundary
Layers Induced by a Linearly
Stretching Permeable Surface**

11:50 AM

M. A. Serag El-Din

**Use of Flow solutions in Highly
resistive Media to Improve BFCs for
Complicated Geometry**

12:15 PM

D. Touzopoulos, G. Bergeles

**Numerical Investigation Of The 2D
and 3D Incompressible Flow In a
Sudden Expansion Duct**

**Wednesday, December 19, 2001
Session C1: Flow Control and
Diagnostics (I)**

Chairs

**A. Naguib, A. Sherif
Room: Palm D'or**

11:00 AM

**T. Yasunobu, H. Kashimura, H-D. Kim,
T. Nakano and T. Setoguchi
Characteristics of Compression Wave
Caused by Reflection of Expansion
Wave at Open End of Tube**

11:25 AM

**M. F. Khalil, S. Z. Kassab, A. A.
Elmiligui, F. A. Naoum
Application of Entropy Concept in the
Study of Velocity Distribution for
Pipe Flow with Drag Reducing
Polymer Additives**

11:50 AM

**R. Messiha, A. El-Baz, M. A. E. Selim
Experimental and Numerical Study of
Turbulent Wake Flow Behind
Perforated Disks**

12:15 PM

**T. Nakano, S. Matsuo, T. Setoguchi, K.
Kaneko and H. Kashimura
Control of Exiting Impulsive Wave
Caused by Compression Wave from
a Tube**

**Wednesday, December 19, 2001
Session A2: Computational and
Experimental Fluid Dynamics (II)
Chairs**

**O. Elbahar, T. Yokomizo
Room: Taba 1,2**

02:00 PM

**O. Zeitoun, A. S. Hegazy
Heat Transfer For Laminar Flow In
Internally Finned Pipes With Different
Fin Heights And Uniform Wall
Temperature**

02:25 PM

**O. El-Masry
Simulation of Flow and Thermal
Characteristics for Cooling Water
System of a Steam Power Plant**

02:50 PM

**N. H. Mostafa
Computing Turbulent Flow Field of
Swirl Jet**

03:15 PM

**A. A. Seif, F. M. Almohaisen
Numerical Study of Turbulent free Jets
Using $k-\epsilon$ Model**

Wednesday, December 19, 2001
Session B2: Flow Control and
Diagnostics (II)

Chairs

M. Elkotb, M. Gad-el-Hak

Room: Taba 3

02:00 PM

A. Al-Salaymeh, F. Durst, and M. Gad-el-Hak

Development and Characterization of a Thermal Flow Sensor with a Wide Bandwidth

02:25 PM

M. Daoud, A. Naguib, and Y. Li

A Doppler Sensor for High-Resolution Measurements of the Turbulent Wall Pressure at High Reynolds Numbers

02:50 PM

G. Simandirakis and K. D. Papailiou

Simulation of The Control of Flow Separation Using Synthetic Jets

03:15 PM

B. W. Skews, and G. K. E. Doyle

Shock Wave Passage Over Porous Particle Beds

**Wednesday, December 19, 2001
Session C2: Multiphase and Reacting
Flow (I)**

Chairs

O. Elmasry, H. Salem

Room: Palm D'or

02:00 PM

**A. F. Abdel Azim, H. El-Salamawy, M.
Shamloul, O. M. Mesalhy**

**Prediction of Engine Intake Filter
Performance And Its Impact On
Engine Erosion in Cairo City**

02:25 PM

M. S. Mansour

**Stability Characteristics of Lifted
Turbulent Partially Premixed Jet
Flames**

02:50 PM

**O. Rashed, B. Hafez, A. Penninger
Atomizer Air Velocity Effect on Multi-
Component Drop Evaporation and
Flow Characteristics**

03:15 PM

A. S. Ismail

**Analysis of Unstable Bicomponent
Cooling Lubricant Flow in Inlet
Annular Channels of the BTA Drills in
the Presence of Dynamic Breakage
and Coalescence Processes.**

**Wednesday, December 19, 2001
Session A3: Computational and
Experimental Fluid Dynamics (III)**

Chairs

**Th. Abou-Arab, A. Hamed
Room: Taba 1,2**

04:00 PM

**O. Rashed, B. Hafez, A. Penninger
Gas Temperature Influence On
Swirling/Non-swirling Flow
Characteristics**

04:25 PM

**H. A. Abdallah, E. A. ElShenawy, A. E.
Kabeel, Z. M. Omara
Experimental Performance Analysis
Of Annular Diffusers With And Without
Swirl**

04:50 PM

**A. A. Salman
Numerical Prediction of Air Flow
Patterns in a 2-D Room Model under
Different Ceiling Shape with and
without Passive Control**

05:15 PM

**J-J. Shu
Prediction and Analysis of Tides and
Tidal Currents**

Wednesday, December 19, 2001
Session B3: Stability and Transition (I)

Chairs

J. Iwamoto, M. Rayan

Room: Taba 3

04:00 PM

M. E. Ali, D. Mitrab and R. M. Lueptow
Stability of a Suspension in Taylor
Couette Flow

04:25 PM

N. H. Mostafa
Computed Transient Supercavitating
Flow over a Projectile

04:50 PM

A. S. Ismail

Analysis of Unstable Bicomponent
Cooling Lubricant Flow in Inlet
Annular Channels of the BTA Drills
Considering Interaction Processes,
Thermal Effect and Heat Transfer From
the Bounding Surfaces.

05:15 PM

E. Tamura and J. Iwamoto

A Measurement of Velocity under
Pulsating-Flow Conditions in the Pipe
with an Orifice

**Wednesday, December 19, 2001
Session C3: Turbomachinery and
Propulsion (I)**

Chairs

**M. G. Khalafallah, D. Hosny
Room: Palm D'or**

04:00 PM

**M. A. Serag El-Din
Prediction of Wind-Farm
Performance: Challenges and
Expectations**

04:25 PM

**M. L. Ugrymov, A. M. Tsegelnik
Information Technology of a
Turbomachinery Row Formation**

04:50 PM

**W. A. Wahba, A. Tourlidakis
A Parallel Genetic Algorithm Applied
To the Design of Blade Profiles For
Centrifugal Pump Impellers**

05:15 PM

**S. Mikhail, M. G. Khalafallah, M. El-
Nady
Disk Friction Loss In Centrifugal And
Mixed Flow Pumps**

**Thursday, December 20, 2001
Session A4: Computational and
Experimental Fluid Dynamics (IV)**

Chairs

**M. A. Serag-El-Din, B. Skews
Room: Taba 1,2**

09:00 AM

**A. T. M. Rofiqul Islam, Y. Kozato, S.
Imao, and T. Tanaka
Study of a Turbulent Cylindrical Wall
Jet Impinging Normally on a Flat
Plate**

09:25 AM

**S. Al-Hajraf and P. Rubini
Lagrangian Numerical Modeling of
Suspension and Saltation in the
Atmospheric Boundary Layer**

09:50 AM

**B. Elhadidi and A. O. Sherif
Computational Study Of Flow In
Mechanically Ventilated Spaces**

10:15 AM

**M. Buschmann and M. Gad-el-Hak
The Logarithmic Law in Turbulent
Boundary Layers: The Debate
Continues**

**Thursday, December 20, 2001 Session
B4: Aero-Acoustics**

Chairs

**A. Hamed, Sh. Keddah
Room: Taba 3**

09:00 AM

**A. S. Sabry, J. K. Kamel, M. A. Fouad
Numerical Simulation of Open Rotor
Noise**

09:25 AM

**M. F. Abdelkhalek, Z. Ghoneim, A. F.
Ghoneim
Numerical Simulation of Acoustic
Effect on the Stability of a Lean
Premixed Combustor**

09:50 AM

**A. Ali, Oliver V. Atassi and H. M. Atassi
Acoustic Radiation from an Annular
Cascade in a Swirling Flow**

10:15 AM

**B. Elhadidi and H. M. Atassi
Sound Generation and Scattering
from Radial Vanes in Uniform Flow**

**Thursday, December 20, 2001 Session
C4: Multiphase and Reacting Flow (II)**

Chairs

B. Mehta, M. Sedrak

Room: Palm D'or

09:00 AM

H. Kim, T. Setoguchi, S. Matsuo, S. Baek and S. Kwon

**A CFD Study of the Self-Excited
Nozzle Flows with Nonequilibrium
Condensation**

09:25 AM

A. Hamed and A. Mohamed

**Simultaneous LDV Measurements of
Gas and Particle Velocities in Two-
Phase Flow**

09:50 AM

B. V. Mehta

**Multiphase CFD of Gasoline Flow in a
Novel Automobile Fuel Pipe System**

10:15 AM

M. Pozarnik and L. Skerget

**Influence of Interphase Drag
Coefficient on Two-Phase Flow by
Boundary Domain Integral Method
Using Velocity-Vorticity Formulation**

**Thursday, December 20, 2001 Session
A5: Turbomachinery and Propulsion
(II)**

Chairs

**A. Mobarak, W. Wahba
Room: Taba 1,2**

11:00 AM

**M. G. Higazy N. N. Bayomi
Effect of Grooves Geometry on
Characteristics of Strong Adverse
Pressure Gradient Flow**

11:25 AM

**S. Z. Kassab, H. A. Kandil, H. A.
Warda, W. H. Ahmed
Performance of an Airlift Pump
Operating in Two-Phase Flow**

11:50 AM

**S-Y. Cho and C. Park
A Study of 2-D Turbine Blade Profile to
Minimize the Pressure Loss**

12:15 PM

**K. H. Kim and Y. H. Shin
Measurements of Unsteady Flow of
Centrifugal Compressor with Vaned
Diffuser**

**Thursday, December 20, 2001 Session
B5: Stability and Transition (II)**

Chairs

**M. Gad-el-Hak, H. Heikel
Room: Tab 3**

11:00 AM

**G. Ozkan, Oe Dolek, I. B. Ozdemir
Low Frequency Pressure Fluctuations
Radiating from Coaxial Free Jets**

11:25 AM

**O. El-Samni and N. Kasagi
The Effects of System Rotation with
Three Orthogonal Rotating Axes on
Turbulent Channel Flow**

11:50 AM

**M. Hamadiche, and M. Gad-el-Hak
Spatio-Temporal Stability of Flow
through Collapsible Tubes**

12:15 PM

**M. Hamadiche, and M. Gad-el-Hak
Temporal Stability of Flow Through
Viscoelastic Tubes**

**Thursday, December 20, 2001 Session
C5: Computational and Experimental
Fluid Dynamics (V)**

Chairs

M. Buschmann, M. N. Sabry

Room: Palm D'or

11:00 AM

M. Gad-el-Hak

Flow Physics in Microdevices

11:25 AM

W. Ghaly and G. Vatistas

**A Parametric Study of Axisymmetric
Swirling Flows in a Low Aspect Ratio
Vortex Chamber**

11:50 AM

G. H. Lee and J. H. Baek

**A Numerical Study on the Similarity of
Laminar Flows in Orthogonally
Rotating Rectangular Ducts and
Stationary Curved Rectangular Ducts
of Arbitrary Aspect Ratio**

12:15 PM

S. Tardu and D. Dunn

**Investigation of the Near Wall
Singularities through Experiments and
Direct Numerical Simulations**

Thursday, December 20, 2001 Session
A6: Turbomachinery and Propulsion
(III)

Chairs

O. El-Masry, S. Mikhail
Room: Taba 1,2

02:00 PM

Y. R. Jung, W. G. Park, S.W. Lee K. C. Lee

**Numerical Flow Analysis of a Single-
Stage Ducted Marine Propulsor**

02:25 PM

A.O. Sherif and M.A. Hussein
**A Computational investigation of the
Back Step Flow**

02:50 PM

D. M. Hosny
**New Turbomachinery Housing
Development**

03:15 PM

D. M. Hosny
**Test Rig Development for
Turbomachinery Components**

**Thursday, December 20, 2001 Session
B6: Computational and Experimental
Fluid Dynamics (VI)**

Chairs

W. Ghaly, E. Khalil

Room: Taba 3

02:00 PM

M. Gad-el-Hak

**Compliant Coatings: What Works and
What Does Not?**

02:25 PM

A. F. AbdelGawad, O. E. Abdellatif

**Influence of Various Factors on The
Flow Characteristics through a Gas
Turbine Cascade**

02:50 PM

**M. Y. Hussaini, Z. Ding, and G.
Erlebacher**

**On the Shock Interaction with a
Vortex Ring**

03:15 PM

**F. Martelli, E. Belardini, and P. Adami
Unsteady Flow Simulation in Multi-
Rows Environment**

Thursday, December 20, 2001

**Panel Discussion on The Future of
Natural Gas in Egypt**

Chairs

Eng. Sameh Samir Fahmy

Prof. Dr. Amin Mobarak

Room: Palm D'or

02:15 PM – 04:00 PM

Thursday, December 20, 2001 Session
A7: Multiphase Flow and Flow
Simulation

Chairs

**M. Hamadiche, H. Khater
Room: Taba 1,2**

04:00 PM

**Y. G. Lai, K. B. Chandran, and J.
Lemmon
Fluid Flow Simulation Study of
Mechanical Heart Valve Closure
Dynamics**

04:25 PM

**B. J. Rho, S. G. Lee, K. K. Song and J.
Y. Jung
Spray Characterization of Two Phase
Swirl Atomizer**

04:50 PM

**J. L. Pawloski, C. Y. Ching, and M.
Shoukri
Flow Regimes and Pressure Drop
Measurements of Air-Oil Flow in
Horizontal Pipes**

05:15 PM

**A. A. Hashem and W. A. Aissa
External Vanes Floating Plug Nozzle
Thrust Vector Control**

**Thursday, December 20, 2001 Session
B7: Aero-Acoustics and LES**

Chairs

Z. Ghoneim, C. Kato

Room: Taba 3

04:00 PM

**A. Hamed, D. Basu, and K. Das
Numerical Simulations of Transonic
Flow Acoustic Resonance in Cavity**

04:25 PM

**M. Hamadiche and H. M. Attasi
Interaction between Acoustic and
Vortical Waves in a Swirling Flow**

04:50 PM

**I. Pantle, F. Magagnato, and M. Gabi
Aeroacoustical Computations of
Unsteady Flows Around a Circular
Cylinder**

05:15 PM

**C. Kato, M. Kaiho, and A. Manabe
An Overset Finite-Element LES for
Engineering Applications**

Authors and their Sessions

Abdallah, H.A. -A3
Abdel Azim, A. F. -C2
AbdelGawad, A. F. -B6
Abdelkhalek, M. F. -B4
Abdellatif, O. E. -B6
Adami, P. -B6
Ahmed, W.H. -A5
Aissa, W.A. -A7
Al-Hajraf, S.-A4
Al-Salaymeh, A. -B2
Al-Youssef, F.-B1
Ali, A.-B4
Ali, M. E. -B1, B3
Almohaisen, F. M. -A2
Atassi, H. M. -B4, B4, B7
Atassi, O. V. -B4
Baek, J. H. -C5
Baek, S.-C4
Basu, D. -B7
Bayomi, N. N. -A5
Bazyma, L. A. -A1
Belardini, E. -B6
Bergeles, G. -B1
Buschmann, M.-A4
Chandran, K.B. -A7

Ching, C.Y. -A7
Cho, S-Y -A5
Daoud, M. -B2
Das, K. -B7
Ding, Z. -B6
Dolek, O. -B5
Doyle, G. K. E. -B2
Dunn, D. -C5
Durst, F. -B2
El-Baz, A. -C1
El-Masry, O. -A2
El-Nady, M. -C3
El-Salamawy, H. -C2
El-Samni, O. -B5
Elhadidi, B. -A4, B4
Elmiligui, A.A. -C1
ElShenawy, E.A. -A3
Erlebacher, G. -B6
Fouad, M. A. -B4
Gabi, M. -B7
Gad-el-Hak, M. -B6, C5, B2, B5, B5, A4
Ghaly, W. -C5, A1
Ghoneim, A.F. -B4
Ghoneim, Z. -B4
Hafez, B. -A3, C2
Hamadiche, M. -B5, B5, B7
Hamed, A. -B7, C4

Hashem, A.A. -A7
Hegazy, A. S. -A2
Higazy, M.G. -A5
Ho Kim, K.-A5
Hosny, D. M. -A6, A6
Hussaini, M. Y. -B6
Hussein, M. A.-A6
Imao, S.-A4
Ismail, A. S. -B3, C2
Iwamoto, J. -A1, B3
Jung Y. R.-A6
Jung, J.Y. -A7
Kabeel, A.E.-A3
Kaiho, M.-B7
Kamel, J. K. -B4
Kandil, H.A. -A5
Kaneko, K.-C1
Kasagi, N. -B5
Kashimura, H.-C1, C1
Kassab, S. Z. -A5, C1
Kato, C.-B7
Khalafallah, M.G.-C3
Khalil, M. F. -C1
Kim, H-D-C1
Kim, H.-C4
Kimura, A. -A1
Kozato, Y. -A4

Kwon, S.-C4
Lai, Y. G.-A7
Lee, G. H.-C5
Lee, K. C.-A6
Lee, S. G. -A7
Lee, S.W. -A6
Lemmon, J.-A7
Lueptowb, R. M. -B3
Magagnato, F. -B7
Manabe, A.-B7
Mansour, M. S. -C2
Martelli, F.-B6
Matsuo, S.-C1, C4
Mehta, B. V. -C4
Mengistu, T. -A1
Mesalhy, O.M. -C2
Messiha, R.-C1
Mikhail, S. -C3
Mitrib, D.-B3
Mohamed, A. -C4
Morita, N. -A1
Mostafa, N. H. -A2, B1, B3
Naguib, A.-B2
Nakano, T. -C1, C1
Naoum, F.A. -C1
Omara, Z.M. -A3
Ozdemir, I. B.-B5

Ozkan, G. -B5
Pantle, I. -B7
Papailiou, K.D. -B2
Park, C.-A5
Park, W.G. -A6
Pawloski, J.L. -A7
Penninger, A.-A3, C2
Pozarnik, M. -C4
Rashed, O. -A3, C2
Rashkovan, V. M. -A1
Rho, B.J. -A7
Rofiqul Islam, A.T.M.-A4
Rubini, P.-A4
Sabry, A. S. -B4
Salman, A. A. -A3
Seif, A. A. -A2
Selim, M. A.E. -C1
Serag El-Din, M. A.-B1, C3
Setoguch, T.-C1, C1, C4
Shamloul, M.-C2
Sherif, A. O.-A6, A4
Shin, Y. H.-A5
Shoukri, M. -A7
Shu, J. J. -A3
Simandirakis, G. -B2
Skerget, L. -C4
Skews, B. W. -B2

Song, K.K. -A7
Tamura, E. -B3
Tanaka, T.-A4
Tardu, S. -C5
Tourlidakis, A. -C3
Touzopoulos, D. -B1
Tsegelnik, A. M. -C3
Ugrymov, M. L. -C3
Vatistas, G. -C5
Wahba, W.A. -C3
Warda, H.A.-A5
Yasunobu, T.-C1
Yokomizo, T. -A1
Zeitoun, O.-A2

Session Chairs

Abou-Arab, Th. – A3
Buschmann, M. – C5
Elbahar, O. – A2
Elkotb, M. – B2
El-Masry, O. – C2, A6
Fouad, M. – A1
Gad-el-Hak, M. – B2, B5
Ghaly, w. – B6
Ghoneim, z. – B7
Hamadiche, M. – A7
Hamed, A. – A3, B4
Heikel, H. – B5
Hosny, D. – C3
Iwamoto, J. – A1, B3
Kato, C. – B1, B7
Keddah, Sh. – B4
Khalafallah, M. G. – C3
Khalil, E. – B6
Khater, H. – A7
Mehta, B. C4
Mikhail, S. – A6
Mobarak, A. – A5
Mourad, S. – A1
Naguib, A. – C1
Rayan, M. – B3
Sabry, M. N. – C5
Salem, H. – C2
Sedrak, M. – C4
Serag-El-Din, M. A. – A4
Sherif, A. – C1
Skews, B. – A4
Wahba, w. – A5
Yokomizo, T. – A2

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