



**FIFTH SYMPOSIUM ON
APPLIED AERODYNAMICS AND DESIGN OF AEROSPACE VEHICLES
(SAROD 2011)**

***RECENT ADVANCES IN EXPERIMENTAL AERODYNAMICS
AND AEROSPACE VEHICLE DESIGN***



**16-18 NOVEMBER 2011
Eagleton Resort, Bangalore.**



TECHNICAL PROGRAMME

SESSION SUMMARY

Session No	Session Title	Time	WEDNESDAY, 16 NOV 2011									THURSDAY, 17 NOV 2011						FRIDAY, 18 NOV 2011					
			FORE NOON			AFTER NOON			FORE NOON			AFTER NOON			FORE NOON			AFTER NOON					
			09:00-11:00	11:30-12:15	12:15-01:30	02:15-03:30	03:45-5:15	05:15-6:15	09:00-09:45	09:45-10:30	10:30-10:45	10:45-11:45	11:45-01:15	02:00-03:30	03:30-05:15	09:00-09:45	09:45-11:15	11:30-01:00	01:00-01:45	01:45-03:30	03:30-04:30		
1	Conceptual Design-I			H - 1																			
2	Wind Tunnel Testing-I			H - 2																			
3	Applied CFD-I			H - 3																			
4	Conceptual Design-II				H - 1																		
5	Wind Tunnel Testing-II				H - 2																		
6	Applied CFD-II				H - 3																		
7	Conceptual Design-III					H - 1																	
8	Wind Tunnel Testing-III					H - 2																	
9	Applied CFD-III					H - 3																	
10	Aerostats & Airships									H - 1													
11	Wind Tunnel Testing-IV									H - 2													
12	Applied CFD-IV									H - 3													
13	Flight Mechanics & Control -I										H - 1												
14	Wind Tunnel Instrumentation-I										H - 2												
15	Applied CFD-V										H - 3												
16	Mini & Micro UAVS											H - 1											
17	Aeroelasticity											H - 2											
18	Aircraft Aerodynamics - I											H - 3											
19	Aircraft Aerodynamics - II													H - 1									
20	Design Optimization													H - 2									
21	Wind Tunnel Instrumentation-II													H - 3									
22	Missiles and Launch Vehicles														H - 1								
23	Flight Mechanics & Control -II														H - 2								
24	Simulation & Modeling														H - 3								
25	Applied CFD-VI															H - 1							
26	High Speed Aerodynamics															H - 2							
27	Wind Energy															H - 3							
			INUAGURAL SESSION	HIGH TEA	PLENARY SESSION - I	LUNCH	TEA	VENDOR SESSION	CULTURAL EVENT	BANQUET DINNER	PLENARY SESSION - II	PLENARY SESSION - III	TEA	VENDOR SESSION	LUNCH	TEA	PLENARY SESSION - IV	TEA	LUNCH	TEA	PANEL DISCUSSION AND CONCLUDING SESSION		

WEDNESDAY NOVEMBER 16, 2011

9:00 - 11:00am: Inaugural Session

LOTUS Hall

Invocation & Lighting of Lamp

Welcome Address, introduction to Symposium by Mr. N Balachandran, Chairman, NOC, SAROD-2011

Introduction of Dignitaries on the Dais by Mr. PS Krishnan, Director, ADE

Relevance of SAROD to Indian Aerospace Programmes by Mr. PS Subramanyam, PGD(CA) & Director, ADA

Release of Proceedings, Directory of Aerodynamicists and Souvenir by Dr. Subhananda Rao, CCR&D (Aero), DRDO

Address by Chief Guest, Dr. VK Saraswat, SA to RM, Secretary Defence R&D and DG DRDO

Presidential Address by Dr. Prahlada, Vice Chancellor, DIAT

Keynote Address by Dr. AR Upadhya, Former Director, NAL

Honoring of Eminent Aerodynamicists

Vote of Thanks by Mr. P Dhandapani, Secretary, NOC, SAROD-2011

Inauguration of Exhibition by Chief Guest




11:00 - 11:30am: High Tea




LOTUS Hall




11:30am - 12:15pm

Plenary Talk 1 : ‘Next Generation Aero Systems – Green, Efficient and Intelligent’, Dr Prahlada, Vice Chancellor, DIAT, Pune

Chair: Dr. Kota Harinarayana, ‘Dr D S Kothari Chair’, Bangalore

WEDNESDAY, NOVEMBER 16, 2011				
12:15 - 1:30pm Sessions 1, 2 and 3				
12:15pm	12:45pm	1:00pm	1:15pm	1:30 – 1:45pm
	1	2	3	
SESSION 1 : CONCEPTUAL DESIGN-I				LOTUS Hall
Chair : Mr. P Jayasimha, Ex. HAL, Bangalore				
	P- 090 G-01	P- 137 G-01	P- 207 G-01	LUNCH
Invited Talk – 1 Multidisciplinary Analysis for a Civil Aircraft Conceptual Sizing  Mr Aaron Yaniv IAI, Israel	<i>Effect of Fore Body on Intake Starting Characteristics</i> V. Thiagarajan, T. K. Ganesh Anavaradham, DRDL, Hyderabad	<i>Static Stability Management of an Air-to-Air Missile Using Deployable Surface</i> Bineet Mehra, Supantha Chaudhur, J. Umakant, DRDL, Hyderabad	<i>Design of Submerged Air Intake</i> Nishikant Tamrakar, L. N.Raghavendra, ADE, Bangalore	
SESSION 2 : WIND TUNNEL TESTING-I				GULMOHAR Hall
Chair : Dr. G K Suryanarayana, NAL, Bangalore				
	P- 191 G-02	P- 066 G-02	P- 131 G-02	LUNCH
Invited Talk – 2 High Speed Aerodynamics Experimental Investigations in TSAGI's T-116 Wind Tunnel  Mr D.Yu. Gusev TsAGI, Russia	<i>Experimental Studies on SM4308 Airfoil at Low Reynolds Numbers</i> S. Sudhakar, Shashank Mishra, G.Ramesh1, K. T. Madhavan, Sajeer Ahmed, CSIR-NAL, Bangalore	<i>Experimental Investigation on High Lift, Low Reynolds Number Airfoils</i> G. Sankar, Bhavneet, ADE, Bangalore, K. Poddar, IIT Kanpur Dr. A Nagel, IAI, Israel	<i>Flow Field Around a Blunt Body with Spike at Supersonic Speed</i> N.Kannamanimuthu, S. Das, P. Kumar, J K Prasad, Birla Institute of Technology, Mesra, Ranchi	
SESSION 3: APPLIED CFD-I				ORCHID Hall
Chair : Prof. M K Laha, IIT Kharagpur				
	P- 009 G-04	P- 167 G-04	P- 071 G-04	LUNCH
Invited Talk – 3 Modern Flow Control Applications to Next-gen Propulsion Flow-paths  Mr. Daniel N. Miller Lockeed Martin, USA	<i>Hypersonic Intake Starting Characteristics – A CFD Validation Study</i> Soumyajit Saha, Debasis Chakraborty, DRDL, Hyderabad	<i>Modelling and Simulation of a Wake Encounter for a Fighter Aircraft</i> C Kamali, Abhay Pashilkar, N Indira, Anup Goyal, Premalatha, Vidyadhar Mudkavi ADA, NAL, Bangalore	<i>CFD Simulation of Flow Past MAV Wings</i> Pradeep Shetty, M.B.Subrahmanya, D.S. Kulkarni, B.N.Rajani, CSIR-NAL, Bangalore	

WEDNESDAY, NOVEMBER 16, 2011				
2:15-3:30pm Sessions 4, 5 and 6				
2:15pm	2:45pm	3:00pm	3:15pm	3:30 – 3:45pm
	1	2	3	
SESSION 4 : CONCEPTUAL DESIGN-II Chair: Prof. Pankaj Priyadarshi, IIST, Trivandrum				LOTUS Hall
	P- 065 G-01	P- 201 G-01	P- 174 G-01	TEA
Invited Talk – 4 <i>High-Lift Low Reynolds Wings for UAV - Development Potential</i>  Dr. Nagel A IAL, Israel	<i>Laminar Airfoil Design and Analysis for Low Speed UAV-A Product Improvement</i> G. Sankar, Bhavneet, N. Balachandran, ADE, Bangalore	<i>Design and CFD Analysis of Serpentine Engine Exhaust System for Reduced Signature</i> Gogoi , Santosh V Singh, ADA, Bangalore	<i>Performance Analysis of Small Scale Autonomous Underwater Gliders</i> SanketDiwale , Intesaaf Ashraf, IIT Bombay	
SESSION 5: Wind Tunnel Testing-II Chair: Prof. G Jagadeesh, IISc, Bangalore				GULMOHAR Hall
	P- 129 G-02	P- 122 G-02	P- 237 G-02	TEA
Invited Talk – 5 <i>Stress Wave Force Balances for Hypervelocity Shock Tunnels</i>  Prof. David J. Mee Univ of Queensland, Australia	<i>Effect of Trips on Side Force on Slender Body at Large Angles of Attack</i> P. Kumar, Ch. Srikanth, S. Das , J. K. Prasad, Birla Institute of Technology, Mesra, Ranchi	<i>Reynolds Number and Leading Edge Bluntness Effects on 65° Delta Wing at Subsonic Speed</i> Anand R Rao, Buddhadeb Nath, Gopinath N, Krishna Rakend Reddy, NAL, Bangalore	<i>Experiments on Blunted Nose Body with Aerospike at Mach 6</i> R. Kalimuthu, S.L.N. Desikan, R.C.Mehta, E. Rathakrishnan, VSSC, Trivandrum	
SESSION 6 : APPLIED CFD-II Chair: Prof. S M Deshpande, JNCASR, Bangalore				ORCHID Hall
	P- 079 G-09	P- 040 G-04	P- 134 G-04	TEA
Invited Talk – 6 <i>Review of Recent Progress in the Application of DES for Complex Flows and Loads</i>  Dr. Michel Mallet Dassault Aviation, France	<i>Validation of External Fuel Tank Separation Trajectory Predictions with Flight Test Results</i> D. Narayan, D. Maharana, Nikhil M Babu, S.R. Mohan, P.K. Raveendran, ADA, Bangalore.	<i>Numerical Simulation of Under Expanded Sonic Jet</i> Malsur Dharavath, Debasis Chakraborty, DRDL, Hyderabad	<i>Estimation of Transition in Dual-Bell Nozzle Operation</i> Pallav Kant and Joseph Mathew, IISc, Bangalore	

WEDNESDAY, NOVEMBER 16, 2011				
3:45-5:00pm Sessions 7, 8 and 9				
3:45pm	4:15pm	4:30pm	4:45pm	5:00pm
	1	2	3	4
SESSION 7 : CONCEPTUAL DESIGN-III Chair: Mr. G Natarajan, ADE , Bangalore				LOTUS Hall
	P- 055 G-01	P- 114 G-01	P- 101 G-04	P-133 G-01
Invited Talk – 7 Challenges in Design & Development of a Carrier Borne Fighter Aircraft  Cmde (Retd.) CD Balaji, ADA, Bangalore, India	High-Lift Technology for Low Reynolds UAV Airfoils Design Dr A. Nagel, S. Bauminger, IAI, Israel, G. Sankar, Bhavneet, ADE, Bangalore	Configuration Design: Gliding Kit for Torpedo K Vijay Anand, N Balachandran, Prof N Balakrishnan, IISc ADE, Bangalore	Design and Analysis Tool for Mars Atmospheric Entry Missions Jyothish R. Pillai, Alex John, R.V. Ramanan, IIST, Trivandrum	First Pilot View (FPV) Flying UAV Test Bed for Acoustic and Image Data Generation Dr. K. Senthil Kumar, MIT KV Srinivasan, ADE, Dr. G. Ramesh, NAL, Bangalore
SESSION 8: WIND TUNNEL TESTING-III Chair: Dr. Indira Narayanaswamy, ADA, Bangalore				GULMOHAR Hall
	P- 049 G-02	P- 256 G-02	P- 257 G-02	P- 173 G-04
Invited Talk – 8 The Need and Impetus Toward more Non-Intrusive Measurements in Indian Wind Tunnels  Dr. L Venkatakrishnan, EAD, NAL Bangalore, India	Development and Wind Tunnel Evaluation of a SMA Based Trim Tab Actuator for a Civil Aircraft P. Senthilkumar, S. Jayasankar, Satisha, M. S. Kamaleshaiah, N. S. Prashanth, Alfred Paulsingh, G.N. Dayananda, CSIR – NAL, Bangalore	Elevator Hinge Moment Studies over Generic Winged Body Configuration M.Prasath, V. R.Ganesan, A. E.Sivaramakrishnan, RajanKurade , SambathRao, VSSC, Trivandrum	Experimental Evaluation of Jet Impingement Loads on a Jet deflector of a Flight Vehicle A Satyanarayana, Ch Srikanth, Sunil G Kadam, SV Ramana, K Rajender Kumar, DRDL, Hyderabad	Experimental and Computational Study of Supersonic Wall/Body Mounted Protrusions Rahul Kumar Soni, NishaanPonnuru, S. P. Singh Brijesh Eshpuniyani, IIT Kanpur
SESSION 9 : APPLIED CFD-III Chair: Dr. ACR Pillai, ADE, Bangalore				ORCHID Hall
	P- 059 G-04	P- 261 G-04	P- 229 G-04	P- 060 G-04
Invited Talk – 9 Predictions over the Full Flight Envelope: A Boeing Perspective  Mr Deepak OM Manager, Aero Technology, Boeing, USA	Numerical Investigations of Lateral Characteristics of a Beyond Visual Range Air-to-Air Missile R. Balasubramanian, Vaibhav Shah, Konark Arora, R. Krishnamurthy, Debasis Chakraborty, DRDL, Hyderabad	Assessment of Lifting Line Theory for Turboprop Wings in Tractor Configuration using Euler Code B. R. Rakshith, S. M. Deshpande, C. Praveen, and R. Narasimha, Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore	Aerodynamic Analysis of Annular Plug Nozzles KiranChutkey, B. Vasudevan, N. Balakrishnan, IISc, Bangalore	Influence of Aircraft Flow Field on the Longitudinal Stability of a Missile KonarkArora, K Anandhanarayanan, R rishnamurthy, Debasis Chakraborty, DRDL, Hyderabad
5:15-6:15pm : Vendor Session				LOTUS HALL
6:15-7:30pm : Cultural Program				POOLSIDE
7:30-8:30pm : Banquet Dinner				POOLSIDE

THURSDAY, NOVEMBER 17, 2011

LOTUS Hall

09:00am: Plenary Talk 2: ‘Enabling CFD-Based Design and Analysis : A Boeing Perspective’, Dr. Mori Mani, Boeing, USA

Chair: Dr A Subhananda Rao, CCR&D (Aero), DRDO, Delhi

09:45am: Plenary Talk 3: ‘Large Eddy Simulations for Unsteady Aerodynamics & Aero acoustic Analysis’, Prof. Sanjiva K Lele, Stanford University, USA


Chair: Mr. PS Krishnan, Director, ADE, Bangalore



10:30am: Tea




10:45-11:45am: Vendor Session




LOTUS Hall




11:45-1:15pm Sessions 10, 11 and 12




11:45am	12:15pm	12:30pm	12:45pm	1:00pm	1:15 – 2:00pm
	1	2	3	4	
SESSION 10 : AEROSTATS AND AIR SHIPS					LOTUS Hall
Chair: Mr. Sudhir Gupta, DAERO, Delhi					
	P-175 G-07	P-093 G-07	P-158 G-07	P-250 G-07	
Invited Talk – 10 <i>The Role of the Aerodynamicist in Flight Dynamics Modeling</i>  Prof. M K Laha, IIT Kharagpur, India	<i>Design Estimates on Large Size ($\approx 17000 m^3$) Aerostat Balloon</i> Vikas Rana, Desilva, R.K. Sharma, ADRDE, Agra	<i>Design and Testing of a Medium Size Aerostat Balloon</i> A Kumar, P Gupta, A Sharma and S Gupta, ADRDE, Agra	<i>Stability Analysis of Geostationary Stratospheric Airship - An Analytical Approach</i> Asish Pallapothu, Anuj Kumar Garg, Rohit Singh Alawa, Santosh Kumar Burnwal, A K Ghosh, Ridhi Bhatia, Gaurav Singh, IIT, Kanpur, ADRDE, Agra	<i>An Approach for Testing Lightning Protection System for Aerostat Platform</i> SD Thyagi, Devendra Kumar, Vikas Bharadwaj, Vivek Mairothia, Balasubramanian, SC Sati, ADRDE, Agra	LUNCH

11:45-1:15pm Sessions 10, 11 and 12					
11:45am	12:15pm	12:30am	12:45am	1:00 - 1:15pm	1:15 -2:00 pm
	1	2	3	4	
SESSION 11: WIND TUNNEL TESTING-IV					GULMOHAR Hall
Chair: Dr. S Panneerselvam, IIT Chennai					
	P- 233 G-02	P- 194 G-02	P-180 G-02	P- 130 G-02	LUNCH
Invited Talk – 11 <i>Application of Natural Ventilation for Aerodynamic Drag Reduction of Bluff Bodies</i>  Dr. GK Suryanarayana NTAF, NAL, Bangalore, India	<i>Effectiveness of Passive Devices in Alleviation of Flow-Induced Oscillations of the Nozzles of a Multi-Booster Launch Vehicle</i> G K Suryanarayana, V Nagarajan, Pankaj Priyadarshi, V R Ganesan, A E Sivaramakrishnan, NAL, Bangalore	<i>Experimental Measurement of Separating Flow within a Short Serpentine Intake Duct</i> Rahul K. Singh, Mitul K. Sonker, Valliammai, ADA, Bangalore. A. Kushari, IIT, Kanpur	<i>Experimental Study of Aerodynamic Characteristics for Conventional Parachute</i> Vipin Kumar, Swadesh Kumar, Ravi Krishna, Santosh Kumar Dehury, K. Kumar, S. P. Singh ADRDE, Agra VSSC, Trivandrum	<i>Effect of Notched Cowl on Flow Field Inside a Supersonic Air-Intake</i> V. JagadishBabu, P. Kumar, S. Das, J. K. Prasad, Birla Institute of Technology, Mesra, Ranchi	
SESSION 12 : APPLIED CFD-IV					ORCHID Hall
Chair: Mr. AE Sivaramakrishnan, VSSC, Trivandrum					
	P- 005 G-04	P- 011 G-04	P- 026 G-04	P- 024 G-04	LUNCH
Invited Talk – 12 <i>Development of Non-Intrusive Flow Diagnostic Capabilities at the Aero-Physics Laboratory</i>  Prof. K. Kontis Univ of Manchester, UK	<i>Numerical Study of the Effect of Thickness Ratio and Reynolds Number on Laminar Flow Past Rectangular Cylinder</i> Ravi Kumar. P, K. Arul Prakash, IIT Madras	<i>Effect of Side-Fence on Shock/Boundary Layer Interaction in a Scramjet Inlet</i> Sarvesh. S, Nithiyaraj M, Vighnesh Pawar, Krishnendu Sinha, IIT Bombay	<i>Numerical Investigation of Surge Margin Improvement in a Transonic Compressor using Casing Treatment</i> P Kirubakaran, C Kishore Kumar, Ajay Pratap, Sasikanta Parida, GTRE, Bangalore	<i>Numerical Solution of the Two Dimensional Steady Incompressible Viscous Flow on a Deep Lid-Driven Cavity using a Multi grid Method</i> Banamali Dalai, Dr Manas Kumar Laha, IIT Kharagpur	




THURSDAY, NOVEMBER 17, 2011					
2:00-3:30pm Sessions 13, 14 and 15					
2:00pm	2:30pm	2:45pm	3:00pm	3:15pm	3:30 – 3:45pm
	1	2	3	4	
SESSION 13: FLIGHT MECH. AND CONTROL-I Chair: Mr. P Srikumar, ADE, Bangalore					LOTUS Hall
	P-032 G-09	P-057 G-09	P-157 G-07	P-021 G-09	
Invited Talk – 13 Fault-Tolerant Neural Controllers For Aircraft Auto-Landings  Prof. N Sundararajan Ex VSSC, India	<i>Aerodynamic Parameter Estimation of RLV using Kalman Filter</i> Balamurugan S, Premkumar V, Jayanta Dhaoya, Lebonah B, Priyankar Bandyopadhyay, VSSC, Trivandrum	<i>Robust Control Design Analysis Through Monte-Carlo Simulation</i> Hitesh Kumar Gaur, Sushil Mohan Ratnaker, Jagdeesh Balaji, AV Sabnis, ADE, Bangalore	<i>Implementation of Nonlinear Dynamic Inversion Control Technique for control of Stratospheric Airship</i> Sunil Sharma, Anuj Kumar Garg, Asish Pallapothu, Santosh Kumar Burnwal, Rohit Singh Alawa, AK Ghosh, IIT Kanpur	<i>Validation of FCOM Profiles for Aircraft Engine Flight Data Using Neural Networks</i> Anjana Krishnan, C M Ananda, CSIR-NAL, Bangalore	TEA
SESSION 14 : WIND TUNNEL INSTRUMENTATION-I Chair: Mr. KV Srinivasan, ADE, Bangalore			GULMOHAR Hall		
	P-075 G-03	P-074 G-03	P-119 G-03	P-046 G-03	
Invited Talk – 14 Health Monitoring of Strain Gauge Balance  Dr. Stephen WD Wolf, ONERA, France	<i>Calibration of Conical Mass Flow Control Device for Air Intake Model Tests</i> D B Singh, P S Suprabha, P R Gopinath, Murlidhara H S, S R Mohan and D Koner, CSIR-NAL, Bangalore	<i>Development of 8-Channel Wireless Data Acquisition System for Wind Tunnel</i> Divya S, D B Singh, Y Lakshmi kanthiah, K Prasad Rao, CSIR-NAL, Bangalore	<i>Application of Global Regression Method for Calibration of Wind Tunnel Balances</i> Gireesh Yanamashetti, H Sundara Murthy, CSIR-NAL, Bangalore	<i>Design, Computational Analysis & Fabrication of Yaw Meter At Mach 2.5</i> J.V. Muruga Lal Jeyan, Ambly Ajay kumar, Anjana Unnikrishnan, Satyam Col. of Engg	TEA
SESSION 15 : APPLIED CFD-V Chair: Mr. ML Kumaraswamy, ADE, Bangalore			ORCHID Hall		
	P-051 G-04	P-126 G-04	P-162 G-04	P-006 G-04	
Invited Talk – 15 CFD Researches of High-Speed Aircraft -Hypersonic Small-Disturbance Theory  Dr NV Voevodenko TsAGI, Russia	<i>CFD Analysis to Investigate the Effect of Axial Spacing in a Single Stage Transonic Axial Flow Compressor</i> Hanoca P, Shobhavathy M T, CSIR-NAL, Bangalore	<i>CFD Analysis of a Launch Vehicle with Reverse Flow Nozzles</i> J Sreenivasulu, Dr MM Patil, AE Sivaramakrishnan, VSSC, Trivandrum	<i>3D Navier Stokes Simulation of Hypersonic Intakes</i> G. Ershath, Rajinikanth, T. K. Ganesh Anavaradham, V. Thiagarajan, DRDL, Hyderabad	<i>Flow-field Analysis of SITVC in a Contoured Nozzle</i> Rhea George, J. Muralikrishna, Raj Kiran Grandhi, RK Gupta, ASL, Hyderabad	TEA

THURSDAY, NOVEMBER 17, 2011					
3:45-5:30pm Sessions 16, 17 and 18					
3:45 pm	4:15 pm	4:30 pm	4:45 pm	5:00pm	5:15 pm
1	2	3	4	5	
SESSION 16: MINI/MICRO UAVS- Chair: Dr. K P Singh, ADA, Bangalore					LOTUS Hall
	P-176 G-08	P-061 G-08	P-086 G-08	P-136 G-08	P-050 G-04
Invited Talk – 16 UAV Design and Configuration Aerodynamics- an ADE Experience  Mr N Balachandran ADE, Bangalore, India	<i>Development of a Blended Wing Configuration MAV</i> D.Thulasi Durai, S R Viswamurthy, Saniya Chaplod, Govind Singh Dhami, Smiti Maini, Abhimanyu Sharma, K Krishnamoorthy, CSIR-NAL, Bangalore	<i>Design, Analysis, Fabrication and Testing of Miniature Propeller for MAVs</i> Prathapanayaka R, Vinod Kumar N, Krishnamurthy S J, CSIR- NAL, Bangalore	<i>Onboard & Far Field Aero Acoustic Environment of a Hex Rotor MAV</i> VS Chandrashekar, BP Shasidara, S Sadasivan, R.Uthirabalan, K. Senthil Kumar, Mohamed Rasheed, A.Kaviyarasu ADE, Bangalore	<i>Design and Development of Quad-Rotor Unmanned Aerial Vehicle</i> A. Mohammed Rasheed, A.Kaviyarasu, Dr.K.Senthil Kumar, MIT, Chennai	<i>Numerical Simulation of Flapping Airfoil to Understand the Flow Physics Associated with Flapping MAVs</i> Senthil Kumar G, Mahuli Pradeep, CMA(Aircraft), CEMILAC, Bangalore
SESSION 17 : AERO-ELASTICITY Chair: Dr Debasis Chakraborty, DRDL,Hyderabad					GULMOHAR Hall
	P-001 G-11	P-069 G-11	P-252 G-10	P-226 G-11	
Invited Talk – 17 Progress in Aero-elastic Computations using Time Accurately Coupled CFD/CSD  Dr. Guruswamy, NASA USA	<i>Flutter Prediction of A Swept Back Plate using Experimental Modal Parameters</i> A.C.Pankaj, Shivaprasad M.V, Shantini G, Chandra N, Nandan A.M, Manjuprasad M, CSIR- NAL, Bangalore	<i>Time Domain Simulation of Airfoil Flutter Using Fluid Structure Coupling Through FEM Based CFD Solver</i> DavinderRana, Sandeep Patel, Amit Kumar Onkar M. Manjuprasad, CSIR-NAL, Bangalore	<i>Dielectric Barrier Discharge for Aerodynamic Flow Control</i> Jim Thomas, Viji M, G Jagadeesh, IISc, Bangalore	<i>Unsteady RANS Based Impulse Response Studies of AGARD Wing for Aeroelastic and Flutter Analysis</i> Sharanappa V. Sajjan, M. A. Padmanabhan, S. Mandal, G. SenGupta, P. K. Dutta, NAL, ADA, ADE, Bangalore Boeing Company, USA	
SESSION 18 : AIRCRAFT AERODYNAMICS-I Chair: Mr. G Sivasankaran, ADE, Bangalore				ORCHID Hall	
	P- 043 G-04	P-030 G-10	P-231 G-04	P-085 G-04	P-199 G-02
Invited Talk – 18 Topic : TBD  Mr. K P Singh HAL, Bangalore, India	<i>CFD-CEM Techniques for Aircraft Signature Analysis</i> Krishna H.S., ADA, Bangalore	<i>Aerodynamic Design and Performance of an Axial Flow Turbine for a Small Turbofan Engine</i> S.V.Ramana Murthy, SharadKapil, R.D Bharathan, R. Ganesh, Dr S. Kishore Kumar, T. Venkata Krishnaiah, GTRE, Bangalore	<i>Application of Generalized Kutta-Joukowski Theorem in Ground Effect Studies</i> Partha Mondal, N. Balakrishnan, IISc, Bangalore	<i>Computational Investigation of Fluidic Thrust Vectoring Nozzle using Commercial STAR-CCM+ Solver</i> Vijay Kumar Kannan, Vadivelan, Venkat Narayan, CD-Adapco India Pvt. Ltd, Bangalore	<i>Rapid Prototyping And Wind Tunnel Testing of a Cranked Wing Model</i> Nikhil Khobragade, Surendranath V, J Dey, ADA, Bangalore.

FRIDAY, NOVEMBER 18, 2011		LOTUS Hall			
9:00-9:45am Plenary Talk 4:Topic: 'Nano Satellites : Challenges & Opportunities', Dr. Mylswamy Annadurai, Programme Director IRS & SSS,ISRO Satellite Centre, Bangalore Chair: Mr. PS Subramanyam, Director, ADA					
9:45-11:15am Sessions 19, 20 and 21					
9:45am	10:15am	10:30am	10:45am	11:00am	11:15-11:30am
		2	3	4	
SESSION 19: AIRCRAFT AERODYNAMICS-II Chair: Prof N Balakrishnan, IISc					LOTUS Hall
	P-201 G-01	P-262 G-06	P-098 G-06	P-047 G-02	TEA
Invited Talk – 19 <i>The Next Decade in Commercial Aircraft Aerodynamics</i>  Dr. Hong Yang, Bombardier, Canada	<i>Design and CFD Analysis of Air Intake for Combat Aircraft</i> A. Gogoi, M. B. Angadi, A. Mall, Santosh V. Singh, K. S. Goud, ADA, Bangalore	<i>Application of System Identification Techniques to Tejas Flight Test Data</i> Jatinder Singh, Amitabh Saraf, Vijay Patel, Basappa and Sachin Tharewal, ADA, NAL, Bangalore	<i>Acoustic Analysis of Unmanned Air vehicle using Acoustic sensors</i> A. Saravanakumar, Dr. K. Senthilkumar, MIT, Chennai	<i>Low Reynolds Number Performance of Small Engine Turbine Blade</i> R. Pushparaj, I. Manuvel Jawahar, Dr. A. P. Haran, Prof S Soundaranayagam, Park Coll. of Engg & Tech, Coimbatore	
SESSION 20 : Design Optimization Chair: Dr Adimurthy IIST, Trivandrum					GULMOHAR Hall
	P-068 G-13	P-264 G-08	P-003 G-08	P-111 G-08	TEA
Invited Talk – 20 <i>Complex system optimization methodologies for Aerospace application</i>  Mr. Pankaj Priyadarshi, IIST, Trivandrum	<i>Planar Trajectory Optimization of a Lifting Projectile using Genetic Algorithms</i> N Subudhi, M K Laha, R Appavuraj, ITR, Chandipur, IITKharagpur	<i>Design and Development of a Transitional Micro Air Vehicle</i> Udit Bansal, B Vani Sindura, S. Panneerselvam, S Santhakumar, IIT, Chennai	<i>Design and Analysis of Micro Propeller and Wing Planform for Micro Flyers</i> T. Rajesh Senthil Kumar, C. Ajay Karthick, R. Krithika, B. Naveen, J. Siva Sudhaa, A. Vimalraj, Amrita Vishwa Vidyapeetham College, Coimbatore	<i>Modelling of Propulsion Unit and Longitudinal Dynamics of Micro Aerial Vehicles</i> Meenakshi Varyani, PEC University of Technology, Chandigarh	
SESSION 21 : WIND TUNNEL INSTRUMENTATION-II Chair: Dr. Sajeer Ahmed, NAL, Bangalore					ORCHID Hall
	P-169 G-03	P-113 G-03	P-076 G-03	P-179 G-03	TEA
Invited Talk – 21 <i>Present Status on Internal Wind Tunnel Balance Technology</i>  Dr. Klaus Hufnagel, Darmstadt Univ of Tech, Germany	<i>Design of A Special Twin Sting Support System for Force Measurements on A Launch Vehicle Model</i> Praveen Jinde, Rajeev. G, Ankur Nagpal - Scientists, CSIR-NAL, VSSC, Trivandrum	<i>Development of Control and Data Acquisition System for Measurement of Roll Damping Derivatives on Slender Models</i> Divya S, M Panneerselvan, K Prasad Rao, CSIR-NAL, Bangalore	<i>Development of an Automated Closed Loop Control System to Control the Exit Area of Supersonic Air- Intake Model using a Stepper Motor</i> Anju Sharma, D B Singh, M. Panneerselvan, CSIR-NAL, Bangalore	<i>Supersonic Testing of NAL Binary Pressure Sensitive Paint</i> Sathya Narayanan, Lakshmi RV, Bharathibai J. Basu, Channa Raju, Venkata Krishnan L, CSIR-NAL, Bangalore	

FRIDAY, NOVEMBER 18, 2011					
11:30-1:00pm Sessions 22, 23 and 24					
11:30am	12:00pm	12:15pm	12:30pm	12:45pm	1:00 – 1:45pm
	1	2	3	4	
SESSION 22 : MISSILES AND LAUNCH VEHICLES					LOTUS Hall
Chair: Dr. P Theerthamalai, DRDL, Hyderabad					
	P-058 G-05	P-112 G-05	P- 088 G-09	P-045 G-01	LUNCH
Invited Talk – 22 <i>ISRO's experiences on development of critical technologies towards Space Programmes</i>  Mr. S. Pandian VSSC, Trivandrum, India	<i>Modelling of Missile Plume Path During Store Separation</i> Ankit Raj, K. Anandha Narayanan, DRDL, Hyderabad	<i>Aerodynamic Design of a Closely Coupled Cruciform Wing-Tail Missile for Area Defence Role</i> S. Rama, K. Prakasam, A. Kamalesh, H. Govindarajan, DRDL, Hyderabad	<i>Control of Air-Breathing Hypersonic Vehicle</i> BreezaPaulose, Gopal Jee, K.MLizy, College of Engineering, VSSC, Trivandrum	<i>The Effect of Swept and Leaned Stator Vanes on Transonic Fan Performance</i> Baljeet Kaur, Ajay Pratap, K. Parida, GTRE, Bangalore	
SESSION 23 : FLIGHT MECH. AND CONTROL-II					GULMOHAR Hall
Chair: Mr. Shyam Chetty, NAL, Bangalore					
	P-258 G-09	P-185 G-09	P-208 G-09	P-145 G-09	LUNCH
Invited Talk – 23 <i>Fluidic Thrust Vectoring and Aerodynamic Flow Control Using MEMS</i>  Prof. Clyde Warsop BAE Systems, UK	<i>Parameter Estimation of an Unstable Aircraft using Neural Networks</i> K Rajesh, M Sinha, HAL, Bangalore, IIT Kharagpur	<i>Improved NGN Algorithm for Parameter Estimation from Flight Data</i> Dhayalan. R, A K Ghosh, IIT Kanpur	<i>Accurate Navigation of a UAV Using Kalman Filter Based GPS / INS Integration</i> Anuj Sharma, Puneet Kumar, Sushil Mohan Ratnaker, S E Talole, DRDO, Delhi	<i>Adaptive Control of Micro Air Vehicles</i> Shaik Ismail, Abhay A. Pashilkar, Ramakalyan Ayyagari, NAL, Bangalore	
SESSION 24: SIMULATION AND MODELING					ORCHID Hall
Chair: Mr. VS Chandrashekar, ADE, Bangalore					
	P-156 G-05	P- 038 G-09	P-168 G-01	P- 141 G-09	LUNCH
Invited Talk – 24 <i>Real time Parametric Modelling and UAV Simulation Systems</i>  Mr. Dan Oller, Presagis, USA	<i>Modeling & Simulation of an Air Launched High Speed Super cavitating Vehicle</i> S K Burnwal, A K Ghosh, IIT Kanpur	<i>Autorotation in Spin: An Uncertainty Analysis</i> Manish R Wankhede, Nandan K Sinha, IIT Chennai	<i>Digital Simulation Model for Turboprop Engine</i> P Lathasree, Abhay A Pashilkar, NAL, Bangalore	<i>Analysis of Effect of Wake Vortices on Air Data Sensors</i> Anup Goyal, Amitabh Saraf, Ambalal Patel, A. Pashilkar, ADA, NAL, Bangalore	

1:45-3:30pm Sessions 25, 26 and 27

1:45pm	2:15pm	2:30pm	2:45pm	3:00pm	3:15pm
	1	2	3	4	5
SESSION 25 : APPLIED CFD-VI					LOTUS Hall
Chair: Dr S Kishorekumar, GTRE, Bangalore					
	P-186 G-04	P-220 G-04	P-263 G-04	P-184 G-04	P-260 G-04
Invited Talk – 25 Independence from Foreign Technologies for Future Aircraft Design Program  Mr. Biju Uthup ADA, Bangalore, India	<i>Aerodynamic Investigations of an Aircraft Store Configuration using CFD</i> Rakesh Kumar, N Balachandran, ADE, Bangalore	<i>High Angles of Attack Aerodynamics of A Generic Missile with Low Aspect Ratio Wing</i> Naveed Ali, DK Yadav, D Vengadesh & G Balu, DRDL, Hyderabad	<i>CFD Simulation Over Aircraft in Non-Linear Region</i> VVS Narayan, R Kannan, R Vijay, KK Shah, KP Singh, ARDC, HAL, Bangalore	<i>Aero-acoustics of a Round Jet and a Plane Jet using LES</i> Subramanian Ganesh, Joseph Mathew, IISc, Bangalore	<i>CFD Simulation on Bell Shaped Rocket Nozzle</i> S.Senthilkumar, G.Abilesh, Nimisha Soman, M.Sandeep, Nehru Institute of Engg & Tech, Coimbatore
SESSION 26 : HIGH SPEED AERODYNAMICS					GULMOHAR Hall
Chair: Prof KPJ Reddy, IISc, Bangalore					
	P-106 G-04	P-041 G-10	P-161 G-10	P-084 G-10	P-028 G-02
Invited Talk – 26 Design and Development of Hypersonic Air-breathing Vehicle  Dr. V. Ramanujachari DRDL, Hyderabad, India	<i>Direct Simulation Monte Carlo (DSMC) Computations of 2D/Axisymmetric Rarefied Hypersonic Flows</i> Sivasubramaniyam A S, Vishnu Venugopal, Brijesh Eshpuniyani, IIT Kanpur	<i>Effect of Injection Angle in Mixing and Combustion Characteristics of Scramjet Combustor</i> MSR Chandra Murty and Debasis Chakraborty, DRDL, Hyderabad	<i>Investigations of Effect of Wall Temperature on the Performance of a Hypersonic Vehicle</i> B Rajinikanth, T K Ganesh Anavaradham, V Thiagarajan, DRDL, Hyderabad	<i>Effect of Circumferential Non-Uniformity in Atomizer Fuel Flow on Gas Turbine Combustor</i> M. Srinivasa Rao, G. Sivaramakrishna, Vimala Narayanan, S. Kishore Kumar, GTRE, Bangalore	<i>Measurement of Heat Transfer Rates for a Large Angle Blunt Cone in Free Piston Driven Hyper sonic Shock Tunnel</i> Mohammed Ibrahim S, KPJ Reddy, IISc, Bangalore
SESSION 27: WIND ENERGY					ORCHID Hall
Chair: Dr YV Mudkavi, NAL, Bangalore					
	P-007 G-14	P-004 G-14	P-192 G-04	P- 100 G-09	P-216 G-11
Invited Talk – 27 Topic : TBD  Dr. S Gomathinayagam CWET, Chennai, India	<i>Augmentation of Torque for Horizontal Axis Wind Turbine by Utilizing Hub Region Flow</i> Kunal Ghosh, Nikhil Ingle, IIT, Kanpur	<i>Design, Testing and Analysis of a Vertical Axis Wind Turbine</i> Dr. Raju S. Ananth, T. Rajesh Senthil Kumar, Chithra Nair, Vaisakh Das, Vishwanath Ravindran, Amrita Vishwa Vidyapeetham College, Coimbatore	<i>Study of Cavity Oscillations and its Control using Synthetic Jet</i> S Sarkar and R Mandal, IIT, Kanpur	<i>Parachute Dynamics Simulation for Human Spaceflight Crew Module Recovery System</i> V. Premkumar, Jayanta Dhaoya, N.Remesh, Jaision Joseph, Abhay kumar, VSSC, Trivandrum	<i>FEM Analysis of Mooring Structure Considering Wind Speed for Transportable Aerostat</i> Amit Kumar, RK Sharma, ADRDE, Agra
3:30-3:45pm : Tea					
3:45-4:30pm : Panel Discussion & Concluding Session					LOTUS Hall