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KNOWLEDGE PRODUCTS: PUBLICATIONS, PRESENTATIONS.....

Knowledge creation, knowledge enhancement, knowledge dissemination and knowledge management have been among the core activities of C-MMACS. Ever since its inception, CMMACS has maintained a high knowledge output in terms of publications and other scientific programmes-knowledge synthesis and exchange through conferences, workshops, brainstorming sessions, etc.

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7.1 Publications in Journals

Sivapoornam S, **Anilkumar V**, **Patra G K** and Iyengar N Ch S N, Analysis and Mitigation of Reflector based Distributed Denial of Service Attacks, *Journal of Computer and Mathematical Sciences*, 1(3), 354-362, 2010.

Goswami P and **Barua J**, Urban Air pollution: Process Identification, Impact Analysis and Evaluation of Forecast Potential, *Meteorology and Atmospheric Physics*, 110 (3-4), 103-122, 2011.

Goswami P and **Gouda K C**, Evaluation of a Dynamical Basis for Advance Forecasting of the Date of Onset of Monsoon Rainfall over India, *Monthly Weather Review* 138 (8), 3120-3141, 2010.

Goswami P, **Himesh S**, and Goud B S, Comparative Analysis of the Role of Domain Size, Horizontal Resolution and Initial Conditions in the Simulation of Tropical Heavy Rainfall Events, *Meteorological Applications*, DOI: 10.1002/met.253, 2011.

Goswami P, **Himesh S**, and Goud B.S, Impact of Urbanization on Tropical Mesoscale Events: Investigation of three Heavy Rainfall Events, *Meteorologische Zeitschrift*, 19 (4), 385-397, 2010.

Goswami P and **Mallick S**, Objective Bias Correction for Improved Skill in Forecasting Diurnal Cycles of Temperature over Multiple Locations: The Summer Case, *Weather and Forecasting*, 26 (1), 26-43, 2011.

Madhukar K, Kumar P V, **Ramamohan T R** and Shivakumara I S, The Dynamics and Normal Stress Evaluation of Dilute Suspensions of Periodically Forced Prolate Spheroids in a Quiescent Newtonian Fluid at Low Reynolds Numbers, *Sadhna*, 35 (6), 659 . 679, 2010.

Sukumaran S, **Parvez I A**, Sant D A, Rangarajan G and Krishnan K, Profiling of Late Tertiary - Early Quaternary Surface in the Lower Reaches of Narmada Valley using Microtremors, *Journal of Asian Earth Sciences*, 41, 325-334, 2011.

Parvez I A, Romanelli F and Panza G F, Long Period Ground Motion at Bedrock Level in Delhi City from Himalayan Earthquake Scenarios, *Pure & Applied Geophysics*, 168, 409-477, 2011

Lyubushin A A and **Parvez I A**, Map of Seismic Hazard of India using Bayesian approach, *Natural Hazards*, 55, 543. 556, 2010.

Rogozhin E A, Ovsyuchenkoa A N and **Parvez I A**, Paleoseismogeological Investigations in a Seismic Gap in the Northwest Caucasus Compared to the West Himalayan Region, *Seismic Instruments*, 46(4), 356-362, 2010.

Rakesh V, Singh R, Pal P K and Joshi P C, Impact of Four Dimensional Assimilation of Satellite Data on Long-Range Simulations over the Indian Region during Monsoon 2006, *Advances in Space Research*, 46, 895–908, 2010.

Rakesh V and **Goswami P**, Impact of Background Error Statistics on 3D-Var Assimilation: Case Study over the Indian Region, *Meteorology and Atmospheric Physics*, 112, 63-79, 2011.

Rakesh V, Singh R and Joshi P C, Evaluation of Mesoscale Model Forecasts over Indian Region during Monsoon 2006, *Pure and Applied Geophysics*, 168, 919-943, 2011.

Senthilkumar V, Buckling Analysis of a Single-Walled Carbon Nanotube with Nonlocal Continuum Elasticity by using Differential Transform Method, *Advanced Science Letters*, 3, 337-340, 2010.

Senthilkumar V, Pradhan S C and Prathap G, Buckling Analysis of Carbon Nanotube based on Nonlocal Timoshenko Beam Theory using Differential Transform Method, *Advanced Science Letters*, 3, 415-421, 2010.

Singh T, Sharma U, Awasthi A K, Virdi N S and Kumar R, Geomorphic and Structural Evidences of Neotectonic Activity in the Sub-Himalayan Belt of Nahan Salient, NW India. *Journal Geological Society of India*, 77, 175-182, 2011.

Swathi P S, **Sharada M K** and **Yajnik K S**, Seasonal cycles of a 3D marine ecosystem model in the North Indian Ocean: Sensitivity to biological process parameters, *Indian Journal of Marine Sciences*, 39 (3), 341-361, 2010.

7.2 Publications in Books/Proceedings

Gouda K C and **Goswami P**, Simulation of Occurrence and Characteristics of Low-Level Cloud over the Western Ghats, *Proceedings of EMS Annual Meeting*, Zürich, Switzerland, EMS2010-389, 13-17 September, 2010.

Gouda K C and **Goswami P**, Ensemble Prediction of Onset of Indian Summer Monsoon Rainfall, *Proceedings of Joint SRNWP Workshop on Data Assimilation and Ensemble Prediction Systems*, Bologna, Italy, 23-25 February 2011.

Goswami P and **Rakesh V**, Impact of Assimilation of Meso-Scale Data on Simulations of Urban Weather: Case Study over Delhi, *Proceedings of the Joint SRNWP Workshop on Data Assimilation and Ensemble Prediction Systems*, Bologna, Italy, 23-25 February 2011.

Indira N K, Ramonet M, Bhatt B C, Schmidt M, Delmotte M, Tiwari Y, Borole D V, Bhattacharya S K, Francey R, Van der Schoot M V, Naja M, Mukai H, Machida T, Schuck T, **Swathi P S**, **Gaur V K**, Effort in Measuring Greenhouse Gases by Setting up Monitoring Stations In India, *World Meteorological Organization, GAW Report 194*, 117-121, 2011.

Madhukar K, **Ramamohan T R** and Shivakumara I S, The Effect of a Constant Bias Force on the Dynamics of a Periodically Forced Spherical Particle in a Newtonian Fluid at Low Reynolds

Numbers, Numerical Analysis and Applied Mathematics, *AIP Conference Proceedings*, 1281, 43-46, 2010.

Manmohan Brahma, Patra G K and Rama Krushna Das, Cloud Based E-healthcare Service for Rural and Mobile India, *India Inc. Challenges & Opportunities-ICIICO-2011*, Excel India Publishers, ISBN: 978-93-80697-43-7, January 2011.

Parvez I A, Hazard and Risk Assessment on Earthquakes in India, *Proceedings Collection of International Seminar on Sharing Experience on Disaster Risk Reduction in Asian Countries*. Beijing, 13-15 October, 137-156, 2010.

Inoue T, **Rajendran K**, Schmetz J, Satoh M and Miura H, Diurnal Variation Appears in Cloud-System Resolving Model and Satellite Observations, *Proceeding of 17th American Meteorological Society Conference*, 2010.

Rakesh V and **Goswami P**, A Comparative Assessment of Background Error Statistics in Assimilation: Case Studies of Tropical Cyclone Tracks over the North Indian Ocean, *Proceedings of the Joint SRNWP Workshop on Data Assimilation and Ensemble Prediction Systems*, Bologna, Italy, 23-25 February 2011.

Senthilkumar V, Pradhan S C and Prathap G, Vibration Analysis of Carbon Nanotube using Nonlocal Timoshenko Beam Theory, *Proceeding of Fifth International Conference on Theoretical Applied Computational and Experimental Mechanics (ICTACEM 2010)*, IIT Kharagpur, 27-29 December 2010.

Senthilkumar V, Vibration Analysis of Double-Walled Carbon Nanotube, *Proceeding of IV European Conference on Computational Mechanics Palais des Congres (ECCOM 2010)*, Paris, France, 16-21 May, 2010.

Sridevi Jade, GNSS Based Realistic Landslide Hazard Modeling, *Landslide Hazard, Consequences & Challenges*, CBRI, Roorkee, February, 35-36, 2011.

Sridevi Jade, GNSS Geodesy based Geoscience Research, Invited Article, National Conference on Geosciences & Water Resources for Sustainable Development, Andhra University, Vishakapatnam, February, 99-107, 2011.

7.3 Presentations in Conferences/Symposia/Workshops/Seminars

Gouda K C, C-MMACS Long-range forecasting of 2010 Monsoon, *IMD Workshop on Performance of Southwest Monsoon (SW)*, India Meteorological Department, Mausam Bhawan, New Delhi, 9-10 December 2010.

Gouda K C, Ensemble Forecasting of Indian Monsoon using a Variable Resolution GCM, *MoES Workshop on Towards the Era of Probabilistic Prediction: From Days to Decades*, Ministry of Earth Sciences, New Delhi, 22-23 February 2011.

Indira N K, Swathi P S, Ramonet M, Rayner P J, Jagadeesha D, Bhatt B C, Delmotte M,

Bousquet P, **Gaur V K**, Robust Estimation of CO₂ Fluxes from Temperate Asia, *7th Annual Meeting of Asia Oceania Geo-sciences Society*, Hyderabad, 5-9 July, 2010.

Ramonet M, **Indira N K**, Tiwari Y, Bhatt B C, Delmotte M, Bousquet P, **Gaur V K**, In-situ Greenhouse Gases Monitoring in India, *7th Annual Meeting of Asia Oceania Geo-sciences Society*, Hyderabad, 5-9 July, 2010.

Kalyani Devasena C, Swathi P S and Sharada M K, Coupling between Interannual Fluctuations of Mixed Layer Properties and Plankton Biomass using Global Ocean Model Simulations and Remote Sensing, *7th Annual Meeting of Asia Oceania Geosciences Society*, Hyderabad, 5-9 July 2010

Parvez I A, Romanelli F and Panza G F, Ground Motion at Bedrock Level in Delhi City from Different Earthquake Scenarios, *International Symposium on Advances in Earthquake Sciences – AES 201*, Institute of Seismological Research, Gandhinagar, 22-24 January, 2011.

Ramamohan T R, The Effect of a Constant Bias Force on the Dynamics of a Periodically Forced Spherical Particle in a Newtonian fluid at low Reynolds numbers, *ICNAAM Numerical Analysis and Applied Mathematics Conference*, Greece, 19 – 25 Sept, 2010.

Ramesh K V, Regional Climate Change and its Implications on Regional Food Production, *XXXI Indian Social Science Congress*, Gauhati University, Gauhati, 27-31 December, 2010.

Singh T and Awasthi A K, Growth of Drainage Basins and Sediment Transport in the Dehradun Reentrant and Nahan Salient of the NW Sub-Himalaya: A Comparative Study, *25th Himalaya-Karakoram-Tibet Workshop*, SFSU, San Francisco, 5-10 June, 2010.

Swathi P S, Anderson T R and Sharada M K, Study of the Physical-biological-chemical Model of Biogeochemical Cycles in the Northern Indian Ocean, *7th Annual Meeting AOGS of Asia Oceania Geosciences Society*, Hyderabad, 5-9 July 2010.

Sharada M K, Swathi P S and Yajnik K S, Modelling and Simulation of Marine Biogeochemical Cycles with Emphasis on Iron Fertilization, *7th Annual Meeting AOGS of Asia Oceania Geosciences Society*, Hyderabad, 5-9 July 2010.

7.4 Internal Reports

Parvez I A, *Hazard and Risk Assessment on Earthquakes in India*, PP CM1005, 2010.

Goswami P and Mallick S, *Generation of Skilful Forecasts at Station Scale through Objective Bias Correction Multiple side Evaluation*, RR CM 2011, Feb 2011.

7.5 Conferences/Symposia/Workshops/Seminars attended

Anil Kumar V

Intel India's First High Performance Computing Round Table, Bangalore, 29-30 July 2010.
First Euro-India Future Internet Research and Experiments Collaboration Workshop, Pune,

16 December, 2010.

Computing for Science Discovery and Innovations: A Roadmap, Tata Institute of Fundamental Research, Mumbai, 18-19 February, 2011.

Technical Workshop on National Knowledge Network, Delhi, 25 March, 2011.

Ashish

Induction Training Program for Newly Recruited Scientists, HRDG, Ghaziabad, 4 July – 13 July 2010

Gouda K C

Intel India Software Conference 2010, Bangalore, 27 September, 2010.

Intel High Performance Computing Conference 2010, Bangalore, 27 November 2010.

Kantha Rao Bhimala and Rakesh V

Induction Training Programme for Newly Recruited Scientists, HRDC Ghaziabad, New Delhi, 07-17 March 2011.

Mahapatra G N

Intel India Software Conference 2010, Bangalore, 27 September, 2010.

Basic WRF Tutorial, NCAR Foothills Laboratory, Boulder, Colorado, USA, 31 January – 4 February, 2011

MET Tutorial, NCAR Foothills Laboratory, Boulder, Colorado, USA, 7 February – 8 February, 2011

Parvez I A

Outreach Meeting/Seminar of the Global Earthquake Model (GEM), Washington DC, United States, 31 May – 4 June, 2010

Workshop on Microtremors, Bijapur, 14 February, 2011

Patra G K

Intel India's First High Performance Computing Round Table, Bangalore, 29-30 July 2010.

Annual Hindi Seminar, NAL, Bangalore, 30 August 2010.

CSIR Open Day Celebration, 26 September, 2010.

High Performance Computing Event, HP, Goa, 27-29 January 2011.

Round Table Meeting on Aspirational Study for NSDI, CDC, DSIR, Bangalore, 18 February, 2011

Prabhu N

Training Programme on Competency Development for Technical Officers, CSIR HRDC, Ghaziabad, 9-13 November, 2010.

Workshop on Linux Security, Dept. of Information Technology, CERT-IN, New Delhi, 11 March, 2011

Prabhu N and Ashapura Marndi

Symantec Enterprise Series 2010, Bangalore, 26 August, 2010.

Senthilkumar V

Seminar on Mathematical Modelling, Measurement and Analysis using MATLAB, Bangalore, 22 March 2011.

Sridevi Jade

CSIR R&D Leadership Summit, 22-24 November, 2010.

Suchanda Ray

Training Programme on Competency Development for Technical Officers, CSIR HRDC, Ghaziabad, 22-25 February, 2011.

Sushant Shekhar

National Conference of Mathematical Modelling and Computer Simulation, BHU, Varanasi, 25-27 March, 2011.

Tejpal Singh

25th Himalaya-Karakoram-Tibet Workshop, SFSU, San Francisco. June 5-10th, 2010.

7.6 Invited Talks

Anil Kumar V

Security Dynamics on the Internet, Workshop on 4G and Wireless Networks, Atria Institute of Technology, Bangalore, 29 October, 2010.

Federation of PlanetLab like Network Testbeds Through Slice based Architecture, Euro-India Future Internet Research and Experiments Collaboration Workshop, Pune, 16 December, 2010

Gouda K C

Multi-scale Modeling of Monsoon Weather Processes, MRI, JMA, Japan, 8 April 2010.

C-MMACS Long-Range, High-Resolution Forecasting of Monsoon-performance for 2010, Round table Meeting on Weather and Climate Modeling, CDAC, Bangalore, 18 February 2011.

Indira N K

The need for Accurate Measurement of Greenhouse Gases for the Estimation of Sources and Sinks of Carbon in India, IMD, New Delhi, 6 Dec. 2010.

Parvez I A

Hazard and Risk Assessment on Earthquakes in India, International Conference on Sharing Experience on Disaster Risk Reduction in Asian Countries, National Disaster Reduction Centre (NDRRC), Beijing, China during 13-15 Oct., 2010

Ground Motion at Bedrock Level in Delhi City from Different Earthquake Scenarios, International Symposium on Advances in Earthquake Sciences - AES 2011, Institute of Seismological Research, Gandhinagar, 23 January, 2011.

Patra G K

Mathematics of Cryptography, Mount Carmel College, Bangalore, 24 July, 2010.
Fuzzy Logic and Coding Theory, Mount Carmel College, Bangalore, 8 October 2010.

Rajendran K

Ultra High Resolution Climate Modeling: Projected Changes in Climate Patterns over Kerala,

Environment Department and Kerala State Planning Board, Govt. of Kerala, 15 December, 2010.

Sridevi Jade

GNSS based Geoscience Research, National Geoscience /Seismicity committee, Ministry of Earth Sciences, New Delhi, June 2010.

GNSS Geodesy and Indian Tectonics, Gandhigram Rural University, Tamilnadu, October 2010,

Vijayan M S M, Long-term deformation of South India using GPS geodesy, Gandhigram Rural University, Tamilnadu, September 2010.

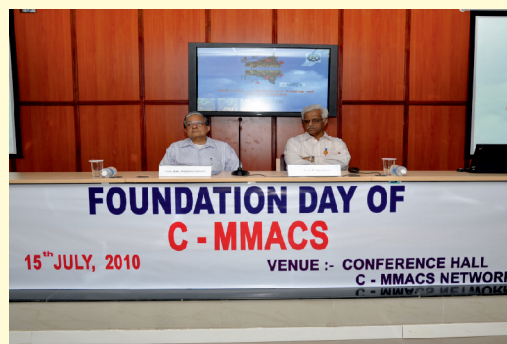
Swathi P S

Numerical Solution of Shallow Water Equations in the Parallel FMS Environment, SERC Summer School on Ocean-Atmosphere Interactions and Global Change, Andhra University, Vishakapatnam, 26-27 July, 2010.

Robust Estimation of Carbon Fluxes from Temperate Asia, XII Plan preparation meeting, NPL, October, 2010.

7.7 Conference/Workshops/Seminars/Scientific Meetings at C-MMACS

C-MMACS Foundation Day Celebration 15th July 2010



C-MMACS Celebrated its Foundation Day on 15th July 2010. The Foundation Day Lecture was given by Dr. R.K. Shyamasundar. He is working at the Tata Institute of Fundamental Research,

Mumbai where he is currently a Senior Professor and J C Bose National Fellow. He delivered a lecture on Multicore and Extreme Scale Computing: Programming and Software Challenges.

Training School on Observation and Analysis of Meteorological Data for Participants of EID Parry, 18-19 January 2011

C-MMACS and EID Parry India have signed an MoU to start a sustained collaborative programme in a resource-sharing framework on precision agriculture through multi-scale forecasting.

A two day training school was organized on analysis of multi-scale observations and forecast of meteorological data for the project team of EID, Parry on 18 and 19th January of 2011. This training school was aimed at acquainting the Parry team with the latest analysis techniques as well as with issues related to validation. Prof. Seshu, Scientist-in-charge, welcomed the participants and the training was provided by a number of scientists from C-MMACS.

Interactive discussions were also held on utilization of the forecasts and planning of joint field experiment for precision agriculture.

Discussion Meeting on the Future Scientific Activities of C-MMACS, February 4, 2011

A half-day Discussion Meeting on the Future Scientific Activities of C-MMACS was held on 4th February, 2011 at Director's Conference Hall, NAL under the chairmanship of Prof. R. Narasimha who was the Director of NAL when C-MMACS was created. One of the highlights of the meeting was the august presence of the key members of the working group that led to the formation of C-MMACS in 1988 and all the Scientists-in-Charge of C-MMACS since its inception. In addition more than 15 eminent scientists from diverse disciplines (engineering, life sciences, mathematical sciences, social sciences etc) and various backgrounds (academia, industry and CSIR family) actively participated in the deliberations. The scientists of C-MMACS were present in full strength and provided timely inputs for the discussions.



Prof. Seshu, Scientist-in-Charge, informed the gathering that C-MMACS was established in 1988 in recognition of the potential of mathematical modeling and computer simulation in providing solutions to visualize the structure and behaviour of complex systems and the wide ranging bearing it had on scientific research in CSIR institutions and elsewhere in the country. As C-MMACS approaches its Silver Jubilee year in 2012-13, it is natural at this stage to take stock of its contributions made so far to addressing challenging problems as well as the new directions for its future engagement. Indeed, a number of discussion meetings at various levels have been held in recent months to gain a sharper focus on our future endeavours. A strong consensus was discerned during these meetings emphasizing the desirability of exploring emerging new areas of scientific research for addressal at C-MMACS by deploying the power of mathematical modeling approaches over a wider front while sharpening the focus of ongoing research activities beyond incremental evolution. The deliberations also pointed to important correctives to its current scientific strength, manifestly sub-critical in most areas, that needed to be addressed.

1-Day Discussion Meeting on 12 Five Year Plan Network Project, 14 February 2011, C-MMACS

1-Day Discussion Meeting involving participants from 6 CSIR Labs: C-MMACS, NISCAIR, NIO RC-Cochin, NGRI, NIO-Goa, NIIST-Trivandrum was held on 14 February 2011 at C-MMACS to discuss the scope of the objectives and decide the work package of individual groups for a network project under 12 Five Year Plan.

First HPC Panel Meeting for setting up of CSIR Supercomputing Facility for Innovative Research, 4 March 2011

A one day HPC panel meeting was organized to understand the current as well as projected computing requirement of CSIR as part of the preparation for setting up of CSIR Supercomputing facility for Innovative Research under the 12th five year plan. The meeting was chaired by Dr Sourav Pal, Director NCL, and more than 25 computational scientists from about 21 CSIR laboratories (other than C-MMACS & NAL) participated in the meeting. Prof. P Seshu, Scientist-in-Charge, welcomed the participants and Dr Sourav Pal presented the purpose of the meeting. Mr R P Thangavelu presented the current and proposed structure of the facility. Parallel discussions were made in different application domain such as Engineering Science, Material sciences, chemistry & nanoscience, Physical & Environmental Sciences and Life Sciences, and then were put together as a form of recommendations. It was recommended to propose an apex facility at CSIR C-MMACS and also suggested to set up specific application groups, organization of training schools etc.

7.8 In-house Seminars/Lectures

Partha S Goswami, *Particle Dynamics in a Turbulent Particle-Gas Suspensions at High Stokes Number*, 13 January, 2011.

Senthilkumar V, *Mesh Distortion Immunity of Finite Elements*, 21 January, 2011.

Sharada M K, *Modelling of Marine Biogeochemical Cycles in the Indian Ocean*, 17 February, 2011

Indira N K, *Estimation of Carbon fluxes from Temperate Asia*, 20 February, 2011.

Swapan Mallick, *Improved Skill for Track and Intensity Forecasting of Tropical Cyclone through Objective Bias Correction*, 3 March, 2011.

Jurismita Baruah, *An Air Pollution Model for Delhi, Driven by GCM Derived Fields*, 10 March, 2011

Ramesh K V, *Food sustainability in the Changing Climate over India*, 17 March, 2011.

Goswami P, *A Dynamical Model for Agricultural Self-Sustainability in a Changing Climate: Application to India*, 31 March, 2011

7.9 Guest Lectures

Akula Venkatram, University of California, Riverside, California, 24 Feb, 2011
The Development of a Comprehensive Air Pollution Model: the Acid Deposition and Oxidant Model (ADOM)

S P Satyabala, CSIR-National Geophysical Research Institute, Hyderabad, 2 March, 2011
Application of InSAR to Earthquakes and Active Faults in and around the Indian Plate,

7.10 Visitors at C-MMACS

Michel Ramonet, Scientist, LSCE, France, 10-16 July 2010

Surajit Sen, Professor, Dept of Physics, State University of New York, USA, 20-21 July 2010

John Edward Serink, Engineer, Trimble Navigation India Ltd, India, 11-12 August 2010.

Tan Siew Siong, Reg Sales Manager, Trimble Navigation India Ltd, India, 11-12 August 2010.

Max Wyss, Director, World Agency of Planetary Monitoring and earthquake Risk reduction, Geneva, 28 November 2010.

Eng Lim Goh, Sr Vice President, Silicon Graphics Intl, USA, 30 November 2010.

Vijay Kumar Kunwar, Army Officer, Kathmandu, Nepal, 13 December 2010.

Andrew Wyatt, Vice President, Asia Pacific, Cray, Australia, 10 February 2011.

Adrian Tate, Technical Head, Scientific Lib Group, Cray Inc, UK, 10 February 2011.

Akula Venkataram, Professor, University of California, USA, 24 February 2011.

Andrew Shih, Sales Manager, Picarro Inc, USA, 1 March 2011.

S P Satyabala, Scientist, NGRI, Hyderabad, India, 7 March 2011.

Saji Mathew, Principal Socila Media Strategist, WebSickle Consulting, 24 March 2011.

Delegations of Faculties, Vellore Institute of Technology, 22 November 2010

Delegations, Dutch Scientific Institutions, 24 March 2011



Scientists at C-MMACS Stall at the Technology Exhibition organized on the occasion of CSIR Foundation Day on 26th September 2010