Knowledge Activities and 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, C-MMACS has maintained a high knowledge output in terms of publications and other scientific programmes-knowledge synthesis and exchange through conferences, workshops, brainstorming sessions, etc.

Highlights

In the year 2005-06, C-MMACS has published 19 articles in SCI journals.C-MMACS scientists had participated in a number of national and international scientific events. And, as usual, C-MMACS had a vibrant year with visitors (30), invited talks (16) and other knowledge activities.

Inside

- Publications in Journals
- Publications in Books/ Proceedings
- Publications in Conferences/Symposia/Workshops
- Internal Reports
- Participation in Conference/Symposia/Workshop/Seminars
- Invited Talks
- Workshops/Conferences/Scientific Meetings at C-MMACS
- Guest Lectures
- In-house Seminars
- Visitors to C-MMACS

5.1 Publications in Journals

P Goswami, K C Gouda and O Talagrand, Ensemble Initial Conditions Through 4d-var Assimilation, *Geophy. Res. Lett*, Vol 32(21), 2005.

S Mukherjee, **P Jafarali** and **G Prathap**, A Variational Basis for Error Analysis in Finite Element Elastodynamic Problems, *Journal of Sound and Vibration*, 285, 615-635, 2005.

Malay Mukul, Continental Deformation and Global Positioning System based Geodesy: *Himalayan Geology*, 26 (1), 193-98, 2005.

Naresh Kumar, Imtiyaz A Parvez and H S Virk, Estimation of Coda Waves Attenuation for NW Himalyan Region using Local Earthquakes, *Phys. Earth Plant Inter*, 151, 243-258, 2005.

K Sangeeta, S Mukherjee and **G Prathap**, A Function Space Approach to Study Rank Deficiency and Spurious Modes in Finite Elements, *Structural Engineering and Mechanics*, 21, 539-551, 2005.

M K Sharada, K S Yajnik and **P S Swathi**, Evaluation of Six Relations of the Kinetics of Uptake by Phytoplankton in Multi-nutrient Environment using JGOFS Experimental Results, *Deep Sea Research II*, Vol.14-15, 1845-2078, 2005.

Sridevi Jade, M B Ananda, P Dileep Kumar and Souvik Banerjee, Co-seismic and Post-seismic Displacements in Andaman and Nicobar Islands from GPS Measurements, *Current Science*, Vol. 88, No. 12, pp 1980-1984, 25 June 2005.

Sridevi Jade, M S M Vijayan and **V K Gaur,** Tushar Prabhu and S. C. Sahu, Estimates of Precipitable Water Vapour from GPS Stations in Indian Subcontinent, International Journal of Atmospheric and Solar-Terrestrial Physics, Volume 67, Issue 6, pp 623-635, April 2005.

Supriyo Mitra, Keith Priestley, Anjan Kr Bhattacharyya, and **V K Gaur**, Crustal Structure and Earthquake focal depths beneath northeastern India and the southern Tibetan Plateau, *Geophys Journal Int*, 160, 227-248, 2005.

Sri Niwas, P K Gupta, and **V K Gaur**, Normalized Impedance Function and the Straightforward Inversion

Scheme for Magneto-telluric Data, *Earth System Science*, Ind Acad. of Sciences, 2005

S Mitra, K Priestley, **V K Gaur**, S S Rai and J Haines, Variation of Group Velocity Dispersion and Seismic heterogeneity of the Indian Lithosphere, *Geophys Journal International*, 2005

K Wallace, R Bilham, F Blume, **V K Gaur** and V Gahalaut, Surface Deformation in the region of the 1905 Kangra Mw=7.8 earthquake int he period 1846-2001, *Geophys Research Letters*, vol. 32, L15307, 2005.

R Krishnan, **K V Ramesh**, B K Samala, G Meyers, J M Slingo and M J Fennessy Indian Ocean-Monsoon coupled interactions and impending monsoon droughts, *Geophysical Research Letters*, March, 2006.

A Gnandesikan, R D Slater, **P S Swathi** and G K Vallis, The Energetics of Ocean Heat Transport, *Journal of Climate*, Vol 18, 2604-2616, 2005.

5.2 Publications in Books/Proceedings

K C Gouda, P Goswami and O Talagrand, Dynamically Generated Ensemble Initial Conditions Through 4D-Var Assimilation System, *5th International Scientific Conference on the Global Energy and Water Cycle*, California, 20-24 June 2005.

S Himesh and **P Goswami**, Effect of Hydro-biospheric Processes on Moist Processes over the Monsoonal Region, 5th International Scientific Conference on the Global Energy and Water Cycle, California, June 20-24, 2005.

G K Patra and **P Goswami**, Pre-monsoon Organization of Dynamics as a Predictor for Monsoon Intensity, *Proceedings 5th International Scientific Conference on the Global Energy and Water Cycle*, 20-24 June 2005, California, USA.

G K Patra and **P Goswami**, Long-range, High Resolution Forecast of Monsoon Rainfall, *International Roundtable on Understanding and Prediction of Summer and Winter Monsoon*, 21-24 November 2005, Jakarata, Indonesia.

G K Patra, Mathematical Model based on Neural Network for High Performance Grid Computing, *Proceedings of*

National Workshop on Mathematical Modeling and High Performance Computing, 28-29 October 2005, Tezpur University, Tezpur.

- V Senthilkumar, S Manju and G Prathap, Mesh distortion Immunity of Finite Elements and the Best-fit Paradigm, Proceedings of International Conference on Computational & Experimental Engineering and Sciences, (ICCES' 05) Dec 2005, India.
- P Rajeevan and P Goswami, Effect of Ocean-Atmosphere Coupling on Tropical Cyclone Track: A Case Study with Bay of Bengal Cyclones, 5th International Scientific Conference on the Global Energy and Water Cycle, California, 20-24 June, 2005.

5.3 Presentations in Conferences/ Symposia/ Workshops/ Meetings

- **V Anil Kumar**, Neural Network Techniques for MI-ERMP, 2nd National Meeting on Multi-Institutional Extended Range Monsoon Prediction, C-MMACS, Bangalore, 12-13 August 2005.
- **V Anil Kumar**, Analysis and Detection of a New Class of DoS Attacks on the Internet, *Ministry of Communication and Information Technology,* New Delhi, 9 August 2005.
- **V Anil Kumar**, DoS Attacks and Intrusion Detection, C-DAC, Bangalore, 22 July 2005
- **P Goswami** and **A Mandal**, Improved Forecast of Rainfall Through Multi-Grid Ensemble, *5th International Scientific Conference on the Global Energy and Water Cycle*, California, 20-24 June, 2005.
- **P Goswami**, Simulation of Meso-scale Events with a GCM: The Heavy Rainfall Episodes of 2005, *National Workshop on Dynamics and Simulation of Extreme Rainfall*, Bangalore, 16 March 2006.
- **K C Gouda**, An Ensemble Initial Condition from 4 D Var Assimilation, *National Workshop on Dynamics and Simulation of Extreme Rainfall*, Bangalore, 16 March 2006.
- **K C Gouda,** 4D-Var Data Assimilation wit Lorenz model, *International Summer School-2005 on Active Geosphere,* ITB, Bandung, Indonesia, 14-29 August, 2005.

- C Acton, S Mitra, **Malay Mukul**, K Priestley and S K Nath, Crustal Structure Beneath the Darjeeling-Sikkim Himalaya from Teleseismic Receiver Functions, EOS Trans. AGU, 86 (53), *Fall Meet Suppl*, Abstract T43A-1377, 2005.
- **Malay Mukul**, Is the Himalayan arc Really Perfect? *Asia Oceania Geosciences Society, 2nd Annual Meeting*, Singapore, 20-24 June, 2005.
- Malay Mukul, Sridevi Jade, A Matin and M S M Vijayan, Global Positioning System (GPS) based Crustal Deformation of the Darjiling-Sikkim Himalaya, Asia Oceania Geosciences Society, 2nd Annual Meeting, Singapore, 20-24 June, 2005.
- **G K Patra**, MI-ERMP: Webhosting and Data Management, 2nd National Meeting on Multi-Institutional Extended Range Monsoon Prediction, 12-13 August, 2005, C-MMACS, Bangalore.
- **G K Patra,** Dynamical Organization Associated with Mumbai Heavy Rainfall Event, *National Workshop on Dynamics and Simulation of Extreme Rainfall*, Bangalore, 16 March 2006.
- **G K Patra** and **P Goswami**, Pre-Monsoon Organization of Dynamics as a Predictor for Monsoon Intensity, *5th International Scientific Conference on the Global Energy and Water Cycle*, California, 20-24 June 2005.
- **G Prathap**, Measurements, Mathematics and Modelling, Workshop on Mathematical Modelling and High Performance Computing, Tezpur University, 30 October 2005.
- **G Prathap**, Abductive Logic and the Field Consistency Basis as the Best Explanation for Locking, *International Conference on Computational & Experimental Engineering and Sciences (ICCES' 05)*, India, 1-6 Dec 2005.
- R Muralikrishna, S Mukherjee and **G Prathap**, Variational Crimes and Finite Element Elastodynamics, *International Conference on Computational & Experimental Engineering and Sciences (ICCES' 05)* India, 1-6 December, 2005.
- **K V Ramesh**, Observed and Diagnostic Features of Different Extreme Weather Events, *National Workshop on Dynamics and Simulation of Extreme Rainfall*, Bangalore, 16 March 2006.

K V Ramesh, Interannual Variability of Upper Ocean Temperature in the Tropical Oceans, *Indo-UK Workshop on Regional Climate Change*, IITM Pune, 23-27 January 2006.

K V Ramesh, Mixed-layer Variability in the North Indian Ocean: Role of Vertical Mixing and Wind Forcing, *International conference Dynamic Planet*, Cairns, Australia, 22-26 August 2005.

K V Ramesh, Seasonal Variability of Heat Content and its Influence on the Thermal Structure of the North Indian Ocean, *IMPA 2006*, IIT Delhi, 14-17 February 2006.

K Sangeeta, S Mukherjee and G Prathap, Generalisation of the Projection Theorem for Finite Element Analysis, *International Conference on* Computational & Experimental Engineering and Sciences (ICCES' 05) 1-6 Dec 2005.

V Senthilkumar, G Prathap and S Manju, Mesh Distortion Immunity of Finite Elements and the Best-fit Paradigm, International Conference on Computational & Experimental Engineering and Sciences (ICCES' 05) 1-6 December, 2005.

Sridevi Jade, Estimates of Plate Velocity, Crustal Deformation and Precipitable Water Vapor from GPS data in Indian Subcontinent, Participant Lecture, IAG-IASPEI/IUGG Joint Capacity Building Workshop on Deformation Measurements and Understanding Natural Hazards in Developing Countries, ICTP, Trieste, Italy, 17-23 January, 2005.

Sridevi Jade, Advances in GPS/GNSS Data Processing, *GRATICULE-2005*, October 2005, Lead paper.

Sridevi Jade, GPS Derived Deformation in Andaman and Nicobar Islands', *One day Seminar on "GPS aided Crustal Deformation Studies in Andaman & Nicobar Islands" after the Great Tsunami of 26th December, 2004*, 28 July, 2005.

Sridevi Jade, Estimation of Slip and Rupture of the Sumatra Earthquake based on Displacement of the C-MMACS GPS network', One day Seminar on "GPS Aided Crustal Deformation Studies in Andaman & Nicobar Islands" after the Great Tsunami of 26th December, 2004, 28 July, 2005.

R P Thangavelu, Towards an IFPReWac Shared HPC Platform for Modelling, *Annual Meeting of the Indo-French Programme for Research in Weather and Climate*, LMD, Paris, 16-18 May, 2005.

5.4 Participation in Conference/Symposia/ Workshops/Training Programme

K C Gouda

One week Workshop on Data Assimilation in Atmospheric and Ocean Modelling, CAOS, Indian Inst. of Science, Bangalore, 2-6 January 2006.

G K Patra & V Anil Kumar

National Seminar on WiMAX- New wave for Broadband Connectivity, MAIT, Bangalore, 7 April 2005.

Two day Workshop on "Wireless LAN", M S Ramaiah School of Advanced Studies, Bangalore, 30 September - 1 October 2005.

SGI Technology Summit 2006, SGI, Bangalore, 1 March 2006.

Voice over IP Seminar 2006, 3-COM, Bangalore, 28 March2006.

V Senthilkumar

ABAQUS Training Programme, C-MMACS, 04 - 08 July 2005

Training on Introduction to NVH using ABAQUS, ABAQUS Engineering India (P) Ltd, Bangalore, 8 Feb 2006.

5.5 Internal Reports

G Prathap, S Manju and **V Senthilkumar**, *The Unsymmetric Finite Element Formulation and Variational Incorrectness*, RR CM 0506, June 2005.

Imtiyaz A Parvez, Franco Vaccari and Giuliano F Panza, *Influence of Source Distance on Site-Effects in Delhi City*, RR CM 0507, June 2005.

Anand Kumar, An Isotropic Numerical Scheme for Simulation of Turbulence, RR CM 0508, December 2005.

S O Imoni, F O Otunta and **T R Ramamohan**, Embedded Implicit Runge-Kutta Nystrum Method for Solving Second Order Differential Equations, RR CM 0509, June 2005.

S O Imoni, F O Otunta and **T R Ramamohan**, *Multiple Solutions of Order Conditions for Runge-Kutte Nystrom Methods for Second-order differential Equations: Diagonally Implicit Methods*, RR CM 0510, June 2005.

Sridevi Jade, Radhakrishna, **P Dileep Kumar, M S M Vijayan**, Nilof S Pasha and Venkateswaran, Remeasurement of GPS Locations in the West Southern Peninsular Shield of India (Sept - Oct 2004), PD CM 0504.

Anand Kumar, *Directionally Unbiased Numerical Schemes*, PD CM 0506, July 2005.

Malay Mukul, Industrial Consultancy Phase I: Premier Oil, India: Structural Geology & Neotectonic Signatures in the Dihing River Lead Area, Upper Assam, India, PD CM 0507, July 2005.

Malay Mukul, Industrial Consultancy Phase I: Premier Oil, India, Structural Geology and Geomorphic Surfaces in the Dirak Footwall Lead Area, Upper Assam, India, PD CM 0508, July 2005.

P Dileep Kumar, M S M Vijayan and Sridevi Jade, First Remeasurement of GPS Locations in the South-Western Peninsular Shield of India (Sept - Nov 2004), PD CM 0509, July 2005.

M B Ananda, P Dileep Kumar and Sridevi Jade, Study of the Seismic Vulnerability and Impact of the Tsunami Effect in Andaman & Nicobar Islands Using GPS, PD CM 0510, July 2005.

Anand Kumar, *Directional Bias in Numerical Schemes*, PD CM 0511, August 2005.

Anand Kumar, On the Grid Independence of Numerical Solutions, PD CM 0512, August 2005.

Imtiyaz A parvez and G Prathap, C-MMACS' Research Performance 1992-2005, PD CM 0513, October 2005.

A Stella Margaret, Knowledge Creation and Dissemination during 2005, PD CM 0601.

Imtiyaz A parvez and **K Madhuker**, *Site response in Ahmedabad Coty using Microtremor Array Observation: A Preliminary Report*, PD CM 0602, April 2006.

M S M Vijayan, P Dileep Kumar, Anil Earnest, Nilof S Pasha and Sridevi Jade, Second Remeasurement of GPS Locations in the South-western Peninsular Shield of India, PD CM 0603, June 2006.

M B Ananda, P Dileep Kumar and Sridevi Jade, GPS Remeasurements in the Garwal Himalayas (Sept-Oct 2005), PD CM 0604, June 2006.

V Anil Kumar, R P Thangavelu and G K Patra, Analysis and Detection of a New Class of Denial-of-Attacks on the Internet, PP CM 0501.

R P Thangavelu, V Anil Kumar and G K Patra, Ashok Kamath, HNV Dutt, Vidyadhar Mudkavi, Report of the Task Team on Restoration of Campus Computer Network, NAL Special Publication 0517, Date:Aug,2005

5.6 Invited Talks

G Prathap

Management by Stress Model of Finite Element Computation: Lecture at GE, Bangalore, 8 April 2005. Measurement and Modelling: Science Lecture, Baldwin College, Bangalore, 2 September 2005.

Management by Stress Model of Finite Element Computation, Distinguished Seminar Series, IIT Kanpur, 3 October 2005.

Two minds or three? Role of creativity in Science, NIAS, Bangalore, 26 October 2005.

... the measure of all things, RRL Jorhat, 3 November 2005.

Mesh Distortion Immunity of Finite Elements and the Best-fit Paradigm: Keynote Lecture, SEC-2005, Bangalore, 14-16 December 2005.

Sridevi Jade

Global Navigation Satellite Systems (GNSS), Indian

Institute of Astrophysics, KodaiKanal, Popular talk, 19 August 2005

Tsunami and Sumatra earthquake- Role of GPS, Shri Shankara Vidyalaya, Kodaikanal, 19 August 2005

GPS Technology and its Application in Atmospheric Modelling, Gandhigram Rural University, Gandhigram, Tamilnadu, 20 August 2005

GIS-GPS/GNSS Integration for Navigational and Positional Services, Course on Emerging trends in GIS, CAIR, DRDO, 2 September 2005

Malay Mukul

Integrated Continental Deformation Studies for Active Tectonic Belts: Insights from the Darjiling-Sikkim Himalayas, Geological Society of India, Bangalore. July 27, 2005.

5.7 Workshop/Conference/ Scientific Meetings

2nd National Meeting on Multi-Institutional Extended Range Monsoon Prediction, C-MMACS, Bangalore, 12-13 August 2005,

National Workshop on Dynamics and Simulation of Extreme Rainfall: Case Study of Recent Events, NAL, Bangalore, Organised by: C-MMACS, Bangalore, Sponsored by: DST, New Delhi, 16-17 March 2006.

Mumbai, India's largest city and financial capital, received a record-high rainfall (944 mm) on Tuesday, July 26, 2005. The related soci-economical impacts are now only too well know; it is reported that 150,000 people were stranded across different railway stations of the Mumbai Suburban Railway, and this unprecedented rainfall produced widespread, massive flooding that was responsible for the deaths of over 1,000, the estimated economic losses were nearly Rs. 1700 cr. While the event of July 26 rainfall in Mumbai is one of the historical record, extreme events today pose a serious threat to a society increasingly dependent on technology, especially in urban areas. Consequent episodes of heavy rainfall events over Bangalore, Chennai and Ahmedabad during 2005 also caused heavy loss in economic and human life.

The purpose of the two day national workshop is to bring together scientists, forecasters and disaster managers

to review current status and national requirement for forecasting and managing extreme weather events. Special focus will be on forecasting and understanding the dynamics of the heavy rainfall events of Mumbai (on July 26, 2005), Bangalore, Chennai, Ahmedabad and evaluation of forecasting skill for such events.

5.8 Guest Lectures

Abhishek K Rai, Seismic Characteristics of the Pan - African High Grade Terranes, Dept of Earth Sciences, University of Cambridge, UK, 12 May 2005.

R Muralikrishna, Geometric Nonlinear Finite Element Analysis of Simply Supported Beams, EACOE & Ph D Scholar, C-MMACS, 24 June 2005.

H K Verma, *Mathematical Modelling in Agriculture for Crop Production*, Head (Retd), Dept of Mathematics & Statistics, Punjab Agricultural University, Ludhiana, 29 June 2005.

S O Imoni, Embedded Implicit Runge-Kutta Nystrom Method for Solving Second Order Differential Equation, Dept of Industrial Mathematics, Adekunle Ajasin University, PMB 001, Akungba, Nigeria, 01 June 2005.

R Ramesh, New Production Measurements in the Northern Indian Ocean, Physical Research Laboratory, Ahmedabad, 04 July 2005.

D Jagadeesha, Application of MOZART for CO2 Flux Estimation, Space Application Centre, Ahmedabad, 11 July 2005.

Micheal Ramonet, *Determination of Regional Co2 Fluxes*, LCSE, CEA Saclay, Gif Sur Yvette Cedex, France, 05 September 2005.

Jonathan Redon, Unsymmetric Finite Element Formulation of Quadratic Traingular Element for Stress Analysis, Matmeca, Bordeaux, France, 14 September 2005.

Venkataraman Lakshmi, *Use of Hydrological Modelling and Microwave Remote Sensing for Studies in Ungaged Basins*, Dept of Geological Sciences, University of South Carolina, 26 October 2005.

Gianluigi Liberti, Satellite Contribution to the Validation and Improvement of Cloud Representation in Numerical

Climate (NWP) Models: An Overview, Insituto di Science Atmosfera e del Clima - CNR, Via Fosso del Cavaliere, Roma-Tor Vergata, Italy, 17 November 2005.

Jurgen Kurths, Synchronization: A Universal Concept in Non-linier Sciences, Potsdam university, Germany, 2 January 2006.

Thomas R Anderson, *Biogeochemical Modelling of C and N in Marine Systems*, Univ of Southampton, UK, 18 January 2006.

Thomas R Anderson, Modelling Dentrification in Arabian Sea, Univ of Southampton, UK, 20 January 2006.

K N Khattri, Seismic Gap Theory: A Knowledge born Intelligent Basis for Seismic Risk Reduction, Dehradun, 20 February 2006.

5.9 In-house Seminar

Mukul M, Tectonics of the Darjeeling-Sikkim Himalayas-Implications for Himalayan Deformation, 11 February 2005.

V Senthilkumar, Mesh Distortion Immunity of Finite Element and the best-fit paradigm, 24 March 2005.

M K Sharada

(i) Inhibitory Effect of Ammonium on the Nitrate Uptake by Phytoplankton: A Comparative Study of Six Mathematical Models

ii) Mathematical Modelling of Biogeochemical Cycles in Bay of Bengal, 11 April 2005.

G Prathap, The Unsymmetric Finite Element Formulation and Variational Incorrectness, 17 June 2005.

Kalyani Devasena, *Mixed Layer Variability in the North Indian Ocean : Role of Vertical Mixing and Wind Forcing*, 16 August 2005.

M B Ananda, *GPS Work at Andaman & Nicobar Islands* - Post Tsunami Experience, 20 July 2005.

Sridevi Jade, Co-Seismic and Post-seismic Displacements in Andaman and Nicobar Islands from GPS Measurements, 21 July 2005.

Anand Kumar, *Isotropic Numerical Scheme*, 21 December 2005.

5.10 Visitors at C-MMACS

Abhishek K Rai

Dept of Earth Sciences, University of Cambridge, UK 12 May 2005

Bruno Rouot, Scientific Attaché French Embassy, Bangalore 18 May 2005

Commander M K Singh, Dy Director Naval Operations Data Processing and Analysis Centre (NODPAC), Kochi 24-25 May 2005

Charlotte Elizabeth Acton University of Cambridge 01 - 30 June 2005

H K Verma, Head (Retd)
Dept of Mathematics & Statistics
Punjab Agricultural University, Ludhiana
29 June 2005

R Ramesh Physical Research Laboratory, Ahmedabad 04 July 2005

D Jagadeesha Space Application Centre, Ahmedabad 11 July 2005

Michel Ramonet LCSE, CEA Saclay, Gif Sur Yvette Cedex, France 05 September 2005

Jim Poston Visiting Professor, UK 08 September 2005

Bharathiar University Students Coimbatore 09 September 2005

Jonathan Redon Matmeca, Bordeaux, France 14-23 September 2005 Dr Eng Lim Goh, Chief Technology Officer Silicon Graphics Inc, USA 22 September 2005

Dr Venkatraman Lakshmi Dep Geological Sciences, University of South Carolina 26 October 2005

Dr G Liberti ISAC-CNR, Italy 09 - 24 November 2005

Prof Juergen Kurths Potsdam University, Germany December 29 - January 5, 2006

Paul Julian Miller Sr Researcher, DEMOS, UK 10 January 2006

Kristen Elizabeth Bound Sr Researcher, DEMOS, UK 10 January 2006 Bernard Heulin Counsiler, French Embassey, Bangalore 25 January 2006

Bruno Rouot Scientific Attaché, French Embassy, Bangalore 25 January 2006

Bernard Dupre Toulouse, France 25 January 2006

Jean Riotte Toulouse, France 25 January 2006

Franco Vaccari Researcher, Univ of Trieste, Italy 19 - 26 February 2006

Fabio Romanelli Professor, Univ of Trieste, Italy 19 - 26 February 2006