

National Symposium on Science & Technology of Plasmas

Sixth National Symposium on Science and Technology of Plasmas was held at CAT during December 17-21, 1990. The symposium was organised by School of Physics, Devi Ahilya Vishwavidyalaya, Indore. About 200 delegates from all over the country participated in the symposium. Over 25 invited lectures were delivered by experts in different branches of this field and about 200 contributed papers were presented in the poster sessions. The topics covered

included magnetic confinement of Tokamak plasmas, laser plasma interaction, chaos in plasmas, free electron lasers, space plasmas and plasma processing of materials. The symposium was inaugurated by Prof M S Sodha Vice-Chancellor of DAVV, who also delivered the key note address. In the concluding session, Dr D D Bhawalkar, Director CAT, also briefed the participants about the various research and developmental activities of CAT. Prof K P Maheshwari of DAVV was the convener of this symposium.

PUBLICATIONS

In Journals

1. "Anomalous changes in lattice parameters, specific heat, and loss factor in potassium titanyl phosphate at 324 K", M S Somayazulu, P U M Sastry and V K Wadhawan, *Solid State Comm.* 78, 499-501 (1991).
2. "Analysis of a noncavity laser with magnifying optics in front of the high reflectivity mirror", S K Dixit, S V Nakhe, B Singh, J K Mittal and R Bhatnagar, *IEEE J Quantum Elect.*, 27, 1143-1145 (1991).
3. "Enhanced X-ray line emission in laser produced plasmas expanding in a background gas", P A Naik, P D Gupta and S R Kumbhare, *Phys. Rev.*, A 43, 4540-4315, (1991).
4. "A copper vapor laser with a positive branch self filtering unstable resonator", R Bhatnagar, S K Dixit, J K Mittal, B Singh, S V Nakhe and K K Sharangpani, *Opt. Commun.*, 82, 557 (1991).
5. "Effect of intracavity spatial filtering on the beam characteristics of a copper vapor laser", B Singh, S K Dixit, J K Mittal, S V Nakhe, R Bhatnagar, *J Appl. Phys.*, 69, 537 (1991).
6. "Amplification of short (4ns) copper vapor laser pulses", B Singh, S V Nakhe, S K Dixit, J K Mittal, R Bhatnagar, *Opt. Commun.*, 81, 17 (1991).
7. "On the frequency-dependent optical length of a laser resonator with an internal Fabry-Perot etalon", S C Mehendale, *IEEE J Quantum Elect.*, 27, 1141 (1991).
8. "Electrical discharge and laser gain characteristics of a coaxial discharge CO₂ laser stabilized by transverse rotating magnetic field", A K Nath, R S Choubey, U V Sree Ramkumar, P Chowdhary, M Kumar and L Abhinandan, *IEEE J Quantum Elect.*, 27, 476-479 (1991).
9. "The role of basal-plane oxygen atoms in determining the ferroelastic and microstructural properties of Y-Ba-Cu-O", V K Wadhawan, *Bul. Mat. Sci.*, 14, 561-565 (1991).
10. "Ferroelasticity : Introductory survey and present status", V K Wadhawan, *Phase Transitions*, 34, 3-18 (1991).
11. "Shape-memory effect in Y-Ba-Cu-O ceramic", R Tiwari and V K Wadhawan, *Phase Transitions*, 35, 47-59 (1991).
12. "CH₃OH Laser line assignments and frequency predictions", G Moruzzi, F Strumia, R M Lees and I Mukhopadhyay, *Infrared Phys.*, 32, 333-347 (1991).
13. "A fast cavity dumper for a picosecond glass laser", S M Oak, K S Bindra, B S Narayan and R K Khardekar, *Rev. Sci. Inst.*, 62, 308-312 (1991).
14. "Anomalous mode in the Raman and IR spectra of mercury telluride", M L Bansal, A Ingale and A P Roy, *Phys. Rev.*, B43, 7020-26 (1991).
15. "Strongly dispersive low frequency Raman modes in germanium", M L Bansal, A K Sood and M Cardona, *Solid State Comm.* 78, 579-82 (1991).
16. "A vector wave analysis of a Bessel beam", S R Mishra, *Opt. Commun.* 85, 159-61 (1991).

Internal Reports

1. "Control system for Indus - I: architecture, methodology and technology", B J Vaidya, CAT/I/91-1, 1991.
2. "Injection into Indus-I", B Singh, G Singh and S S Ramamurthi, CAT/I/91-2, 1991.
3. "An S-band waveguide system for the 20 MeV Injector Microtron", R Bhaskaran, S K Jain and S S Ramamurthi, CAT/I/91-3, 1991.
4. "Ion trapping studies for Indus-I", Deepa Angal, G Singh and S S Ramamurthi, CAT/I/91/4, 1991.

5. "Computer codes for polynomial and circle fitting", R K Mishra, V Tomar, S P Mhaskar and S S Ramamurthi, CAT/I/91-5, 1991.
6. "Microtron magnets design", R K Mishra, S P Mhaskar, V Tomar and S S Ramamurthi, CAT/I/91-6, 1991.
7. "Injection and extraction kicker magnets for booster synchrotron and Indus-I", R K Mishra, S P Mhaskar and S S Ramamurthi, CAT/I/91-7, 1991.

Contributed Papers in Conferences/ Symposia

1. "Fermi resonance in HgTe", Alka Ingale, M L Bansal and A P Roy, Solid State Phys. Symposium, Bombay, Jan 1-4 1991.
2. "Electron states in semiconductor microcrystals: tight binding approach", S V Nair, L M Ramaniah and K C Rustagi, *ibid.*
3. "Local field effects in cuboidal small particles", L M Ramaniah, S V Nair and K C Rustagi, *ibid.*
4. "Sealing of optical windows at low temperatures", S S Marhas, VIIth National Seminar of ISSG on Role of glass in vacuum technology, IISc Bangalore, 9-10 February, 1991.
5. "Fabrication of sample inlet interface of GC mass spectrometer", S S Marhas, M Murugan and M Srinivasan, *ibid.*
6. "Vacuum monitoring and control system" J S Adhikari and P S Fatnani, National Conference on Real Time Systems, SGSITS, Indore, February 23-25, (1991).
7. "VME Bus compatible self scan data acquisition cards", P S Fatnani and J S Adhikari, *ibid.*
8. "Operational characteristics of a transverse flow pulsed discharge sustained CW CO₂ laser", A K Nath, L Abhinandan, P Chowdhary and Manoj Kumar, LASERION-91, Munchen, Germany, June 12-14, 1991.
9. "Stark spectroscopy of ¹³CD₃OH and CH₃OD with the HCN laser", G R Sudhakaran, R M Lees, R L Bhattacharjee and I Mukhopadhyay, 46th Symposium on Mol. spectroscopy, Ohio State University, Columbus, USA, June 17-21 (1991).
10. "Electron induced desorption and clean hydrocarbon free pumping studies", R J Patel, K C Ratnakala, M G Karmarkar and S T Bhavsar, National Symposium on Vacuum Science & Technology, CAT, Indore, November 13-15, 1991.
11. "Design of liquid helium cryostat for Mossbauer spectroscopy (4.2K - 300K)", Ratnesh Gupta, Ajay Gupta, M Thirumaleshwar and P K Kush, *ibid.*
12. "Optimization of pumping speed of triode sputter ion pump for use in UHV range", M L Pandiyar, R J Patel, K C Ratnakala, S T Bhavsar and M G Karmarkar, *ibid.*
13. "Experience on operation of UHV system of booster synchrotron and storage ring quadrants", K C Ratnakala, S T Bhavsar, R J Patel and M L Pandiyar, *ibid.*
14. "Monitoring & control system for magnet power supplies of Synchrotron radiation source (Indus-I) at CAT, Indore", D N Shukla, B J Vaidya and S S Ramamurthi, Current Trends in Data-acquisition and Controls of Accelerators, Calcutta, November 19-21, 1991.
15. "Personal Computer based control system for microtron", J S Adhikari, B J Vaidya and S S Ramamurthi, *ibid.*
16. "Indus-I Lattice modelling programs: A tuning aid for the operator", A Banerjee and S S Ramamurthi, *ibid.*
17. "Development of a CW CO₂ laser system (model C-40) for surgical applications", Y V S T Sai, T P S Nathan, C P Navathe, R Arya, P Shryner, G Mundra, D K Kohli, P Khare, A S Rajarao and D D Bhawalkar, National Symposium on Instrumentation, (NSI-16), Cochin University of Science & Technology, Cochin, November 24-27, 1991.
18. "Development of thermopile detector for CW CO₂ lasers", D K Kohli, Y V S T Sai, Sabir Ali and T P S Nathan, *ibid.*
19. "A CCD based laser beam profile measurement system", R K Khardekar, Y B S R Prasad, H C Pant and D D Bhawalkar, *ibid.*
20. "High power transverse flow CW CO₂ laser", A K Nath, L Abhinandan, P Chowdhary and Manoj Kumar, *ibid.*
21. "Microprocessor based laser fluorimeter", S Kher, V Kumar, N Vyas and A G Bhujle, *ibid.*
22. "Intelligent multi-bath temperature controller", V Kumar, U N Roy and A G Bhujle, *ibid.*
23. "Fibre coupled high repetition rate N₂ laser", B N Singh, N Vyas, A G Bhujle, *ibid.*
24. "Superconducting thick films from combined heat treatment of mixtures of Y-Ba-Cu-O and Bi-Pb-Sr-Ca-Cu-O", J Marfaing, Y Wang, V K Wadhawan and C Boulesteix, DAE Solid State Phys. Symp., BHU Varanasi, December 21-24, 1991.
25. "History effects in higher harmonics of magnetisation in sintered YBaCuO", Shailendra Kumar, P Chaddah, Ram Prasad and N C Soni, *ibid.*
26. "Optical absorption in CdS quantum dots: A tight binding approach", L M Ramaniah and S V Nair, *ibid.*
27. "Electronic states in C-60 - a nearly free electron model", S V Nair and K C Rustagi, *ibid.*

28. "Vacuum system of Indus-I", M G Karmarkar, R J Patel and S S Ramamurthi, DAE Symposium on Nuclear Physics, BARC, Bombay, December 26-30, 1991.
29. "Microtrons and their applications", H C Soni and S S Ramamurthi, *ibid.*

Invited Lectures

1. "Ferroic materials", V K Wadhawan, Indian Science Congress, Indore, January 4-8, 1991.
2. "Lasers in medicine", P K Gupta *ibid.*
3. "Synchrotron radiation source-INDUS-I, G Singh, *ibid.*
4. "Glass and high vacuum", S S Marhas, VIIth National seminar of IISG on role of glass in vacuum technology, IISc Bangalore, February 9-10, 1991.
5. "Glass to metal seals for high vacuum", S S Marhas, workshop on vacuum techniques, IISc Bangalore, February 11-13, 1991.
6. "Development of high power transverse flow CW CO₂ laser in CAT for industrial applications", A K Nath, Third special meet on laser-EB welding, BARC, Bombay, February 18-19, 1991.
7. "Inert gases in glassy metals", R V Nandedkar, International Conference on Disorder and Amorphous System, DAVV, Indore, February, 1991.
8. "Synchrotron radiation and its applications", D D Bhawalkar, at Inter-University Consortium for DAE Facilities and Devi Ahilya University, Indore, March 4-6, 1991.
9. "Nonlinear optical materials", K C Rustagi, Symposium of the Optical society of India, Lucknow, March 8-10, 1991.
10. "Lasers in industry", D D Bhawalkar, Workshop on Contemporary Optics and Opto-electronics, Gwalior, March 22-27, 1991.
11. "Mid-infrared coherent sources", P K Gupta, University of Heidelberg, Heidelberg, March 20, 1991.
12. "Vacuum system design", A S Rajarao, XIV All India Course on Vacuum Science & Technology, BARC, Bombay, April 2-12, 1991.
13. "Curie principle and its applications", V K Wadhawan, University of Aix-Marseille, April 15, 1991.
14. "Ferroic materials - description and applications", V K Wadhawan, April 19, 1991, *ibid.*
15. "Application of synchrotron radiation in materials science", R V Nandedkar, Two lectures at Workshop on Material Science, IUC, Indore, June 91.
16. "Symmetry description of extended defects in crystals", V K Wadhawan, Second Soviet-Indian Symposium on Crystal Growth and Characterization, Moscow, October 14-19, 1991.
17. "Synchrotron radiation facility", D D Bhawalkar, National Seminar on Current Status and Future Trends in Solid State Physics, Pune, October 21-23, 1991.
18. "Laser as a probe for condensed matter", K C Rustagi, *ibid.*
19. "Engineering aspects of UHV systems in accelerators", A S Rajarao, National Symposium on Vacuum Science and Technology, CAT, Indore, November 13-15, 1991.
20. "Design features of the vacuum system of a high altitude chamber facility", A S Rajarao, *ibid.*
21. "Requirement of UHV in a synchrotron radiation source", G Singh, *ibid.*
22. "Control system for synchrotron radiation source (Indus-I)", B J Vaidya, Current Trends in Data-acquisition and Controls of Accelerators, Calcutta, November 19-21, 1991.
23. "Laser beam parameter measurements", T P S Nathan and Y V S T Sai, National Symposium on Instrumentation, (NSI-16) Cochin University of Science & Technology, Cochin, November 24-27, 1991.
24. "Development of accelerators for radiation physics at CAT Indore", S S Ramamurthi, S K Shukla, H C Soni, S C Joshi and Gurnam Singh, Annual meeting of Indian Society for Radiation Physics, Hyderabad, November 1991.
25. "X-ray generation in laser-plasma interaction", P D Gupta, VII National Symposium on Plasma Science & Technology, DAVV, Indore, December 17-21, 1991.
26. "Lasers and their applications", D D Bhawalkar, public lecture, organised by Maharashtra Association for Cultivation of Sciences, Maharashtra Academy of Sciences, Jidyanassa and Poona chapter of Indian National Science Academy, Pune, December 18, 1991.
27. "Lasers and their applications", D D Bhawalkar, Faraday Lecture, organised by IEE Bombay International Centre, Bombay, December 19, 1991.