

Issue 053

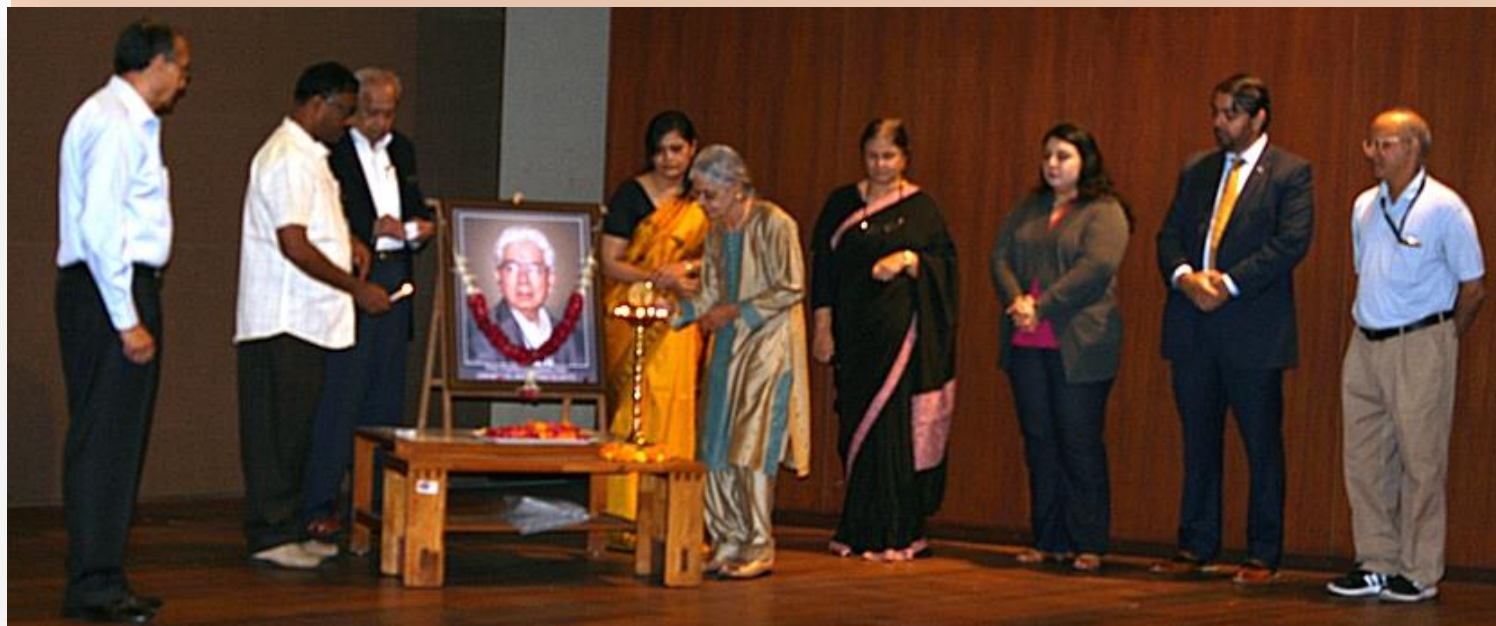
December 2017

The Fourth State

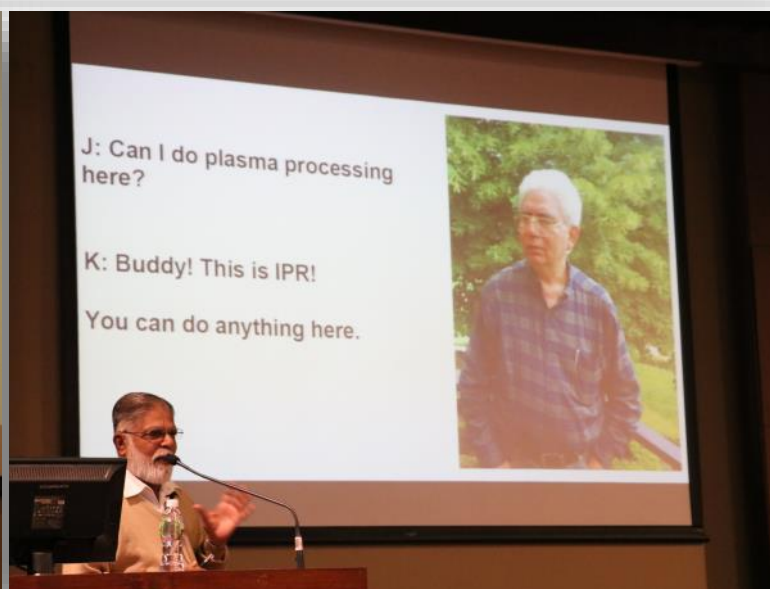
Newsletter of the Institute For Plasma Research, Gandhinagar, Gujarat (India)

Symposium in Memory of Prof. P. K. Kaw

A one-day symposium was organized at EDI on November 06, 2017 to celebrate the scientific achievements of Prof. Predhiman Kaw, the founding director of Institute for Plasma Research. Over 400 people, including his family members attended the symposium. There were eight talks by colleagues of Prof. Kaw who talked about the major achievements in the various areas that Prof. Kaw worked during his long career. The ceremonial lamp was lit by the dignitaries which was followed by Prof. Abhijit Sen's introduction of the early work done by Prof. Kaw and his struggle to set up plasma physics program in India. This was followed by talks by Prof. Y C Saxena, Prof. P I John, Prof. Sudip Sengupta, Prof. Amita Das, Prof. K Avinash, Prof G Ravindra Kumar and Prof. Shishir Deshpande. Prof Kaw's son, Mr. Siddarth Kaw also shared his feelings with the audience and ended his talk with beautiful poem. Prof. Bikas Sinha, Prof. Bimla Buti and many other reputed scientists shared their thoughts about Prof Kaw. Prof. Shashank Chaturvedi, Director, IPR, in his concluding remarks, recollected the valuable moments he had spent with Prof. Kaw. The journey of Prof. Kaw's life was briefly summarized in form of booklet, which was distributed to the participants on this occasion.



Inauguration of the Kaw Memorial Symposium



(L) Prof. Abhijit Sen and (R) Prof. P. I. John speaking during the symposium



(L-R) Dr. Shashank Chaturvedi, Prof. G Ravindra Kumar and Prof Avinash Khare speaking during the symposium.



View of the audience during the Kaw Memorial Symposium



(L-R) Prof. Bikash Sinha, Prof. G. S. Lakhina and Mr. Siddarth Kaw speaking during the symposium.

Some of the talks were “*The Early Years: Parametric instabilities and Laser-Plasma Interactions*” by Prof. Abhijit Sen, “*The Tokamak Programme at IPR: Aditya and SST-1*” by Prof. Y. C. Saxena, “*Basic Experiments at IPR and Plasma Applications for Industry*” by Prof. P. I. John, “*Collective modes in Quark Gluon Plasmas*” by Prof. Sudip Sengupta, “*Dusty Plasma – Theory, Simulations and Experiments*” by Prof. Amita Das, “*Thermodynamics of Complex Plasmas*” by Prof. Avinash Khare, “*The TIFR collaboration: Intense Laser-Matter Interactions*” by Prof. G Ravindra Kumar and “*ITER-India and the National Fusion Roadmap*” by Prof. Shishir Deshpande. The concluding remarks were given by Dr. Shashank Charurvedi, Director, IPR.



(L-R) Prof. Y C Saxena, Dr. Amit Sircar and Prof. Amita Das speaking during the symposium.



(L-R) Prof. Shishir Deshpande, Prof. Sudip Sengupta and Dr. S. Pradhan speaking during the symposium.



(L-R) Prof. Ramesh Narayanan, Mr. Harish Charan and Prof. K. P. Maheshwari speaking during the symposium.

The 32nd National Symposium on Plasma Science & Technology (PLASMA-2017) was organized by IPR during 7-10 November, 2017 at the main auditorium of the Entrepreneurship Development Institute of India (EDI), Bhat, Gandhinagar. Over 450 participants registered for the event which consisted of 15 invited talks and 31 oral presentations spread over 7 oral sessions and 438 poster presentations spread over 4 poster sessions. The programme was inaugurated by the lighting of the traditional lamp by Prof. Prof. Anil Bhardwaj, Director, Physical Research Laboratory, Ahmedabad, Dr. Shashank Chaturvedi, Director, IPR, Prof. Prabal Chattopadhyay (President, PSSI), Shri P K Atrey, Convener, Plasma-2017 and other eminent scientist present at the meeting. Prof. Bharadwaj delivered the Keynote Address, which was followed by the oral and poster sessions.



(L) Inauguration of Plasma-2017 (R) Dr. Shashank Chaturvedi addressing the gathering.



(L) Prof. Anil Bharadwaj delivering the Keynote Address (R) Prof. Prabal Chattopadhyay addressing the gathering



Releasing of the abstract book of Plasma-2017

During the oral and poster sessions, over 28 awardees were selected by the judges and were presented cash awards and certificates. Two awards for the Buti Young Scientist Award were also presented to Dr. Niraj Kumar (CEERI Pilani) and Mr. Deep Kumar Kori (Tezpur University) during the PSSI GBM. The Guzdar Memorial Young Scientist Award was presented to Dr. Girjesh R. Gupta from IUCAA, Pune.



(L) Shri P K Atrey speaking during the Inauguration (R) Dr. Ramasubramanian compered the inauguration event



Images from one of the four poster sessions



(L-R) S Karkari, Pallavi Trivedi, Arghya Mukherjee and Suman Danani presenting their talks



(L) Poster presentation (R) Presentations by Joydeep Ghosh, Harish Charan and Raghuraj Singh



Presentations by (L-R) S. R. Mohanty, Aroh Srivastava, Subhash P V, Bibhu Prasad Sahoo and Nisha Chandwani



(L) View of the audience (R) Presentation by Ms. Harshita Raj



Group photo of the participants of Plasma-2017

PLASMA-2017... Continued



(L) Presentation by Ratan Kumar Bera (R) Poster presentations.



(L) The PSSI GBM in progress (R) The Guzdar Young Scientist Award being presented to Dr. Girjesh R. Gupta by Director, IPR



Poster awards being presented to (L-R) H. D. Nimawat, Hari Prasad MG, Prabhakar Srivastav, Participant Registration in progress

Name of award	Name of the awardee	Title of the award winning poster
Sholapur-wala Poster Awards	P. K. Sharma	Design of a High CW Power Circulator for LHCD System of SST-1 Tokamak
	M. R. Jana	Water cooling system for SST neutral beam injection system: from concept to engineering design
	Mahesh Ghatge	Manufacturing Aspects Of Long Length Superconducting Cable In Conduit Conductors
	H. D. Nimavat	Role of Helium leak detection in SST-1 Cryogenics system
PSSI Oral Awards	Pallavi Trivedi	Effects of Kinetic Ions On the Driven Phase Space Structures in a 1-D Vlasov Plasma
	P. V. Subhash	Overview of ACTYS Project on Development of Indigenous State-of-the-Art Code Suites for Nuclear Activation Analysis
PSSI Poster Awards	Akshay Vaid	Interaction of atmospheric pressure plasma jet with lung cancer cell line
	Hari Prasad M. G.	Experimental Investigation of Crystalline Structures and Phase Transition in DPEx
	Amit Kumar Singh	Zero-dimensional modeling of ECRH-assisted plasma start-up in SST-1
	Bharathi P.	Characterization Of Atmospheric Pressure Plasma Jet Using Optical Emission Spectroscopy
	Prabhakar Srivastav	Inward Turbulent Particle Flux in ETG Dominated Plasma of LVPD
	Kalyani Barman	Optical Emission Spectroscopy and Electrical Modelling of Atmospheric Pressure Micro Plasma Jets

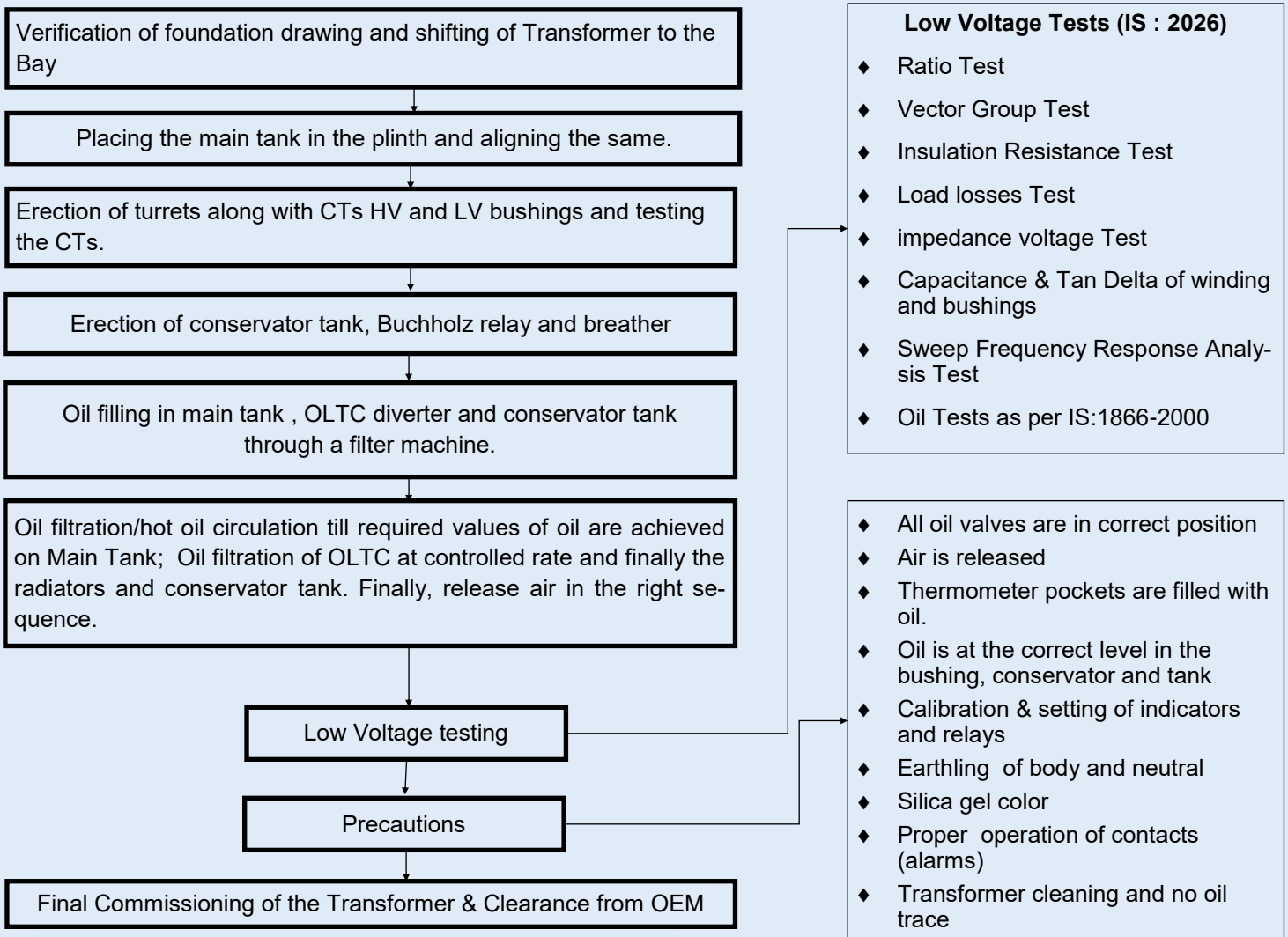
List of winners of PSSI Poster and Oral presentation awards from IPR

Installation, Testing and Commissioning of 132kV/11.2kV Power Transformer at IPR Substation

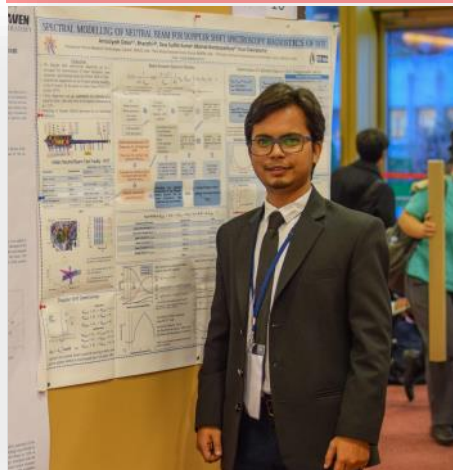
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IPR Electrical Power Distribution System comprises of 132 kV Substation supplied by a dedicated line from the Grid Operator (UGVCL). The 132 kV substation has four step down transformers which bring down the 132 kV supply to 11 kV and 22 kV to cater to the experimental and utility requirements. All the transformers are of different ratings, viz., one 132 kV/11.5 kV, 37.5 MVA; two nos. of 132 kV/11.5 kV, 15 MVA step down Power transformers & One 132kV/22 kV, 31.5 MVA. Recently, a power transformer of rating 132kV / 11.2 kV, 31.5 MVA was installed and commissioned in the IPR substation. Now, the total installed capacity at the substation is 130.5MVA.

The flow chart for Installation, Erection, Testing and Commissioning activities of the Power Transformer is as follows:



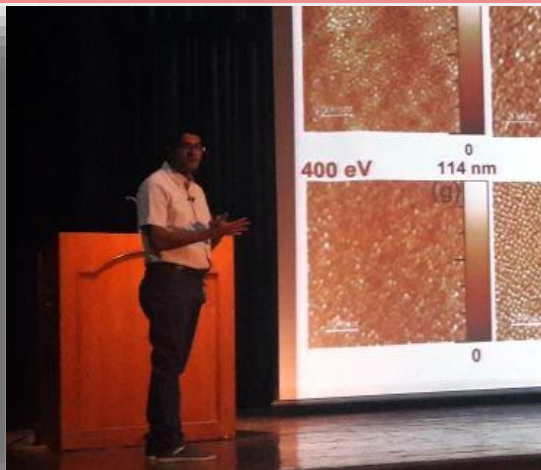
Images of the newly installed Andrew Yule make transformer at IPR switchyard



Mr. Arnab Deka attended the The 17th International Conference on Ion Sources (ICIS 2017). CERN-CICG, Geneva, Switzerland and presented a poster entitled "*Spectral Modelling of Neutral Beam for Doppler Shift Spectroscopy Diagnostics of INTF*". He also visited LINAC3 & 4, ISOLDE and ALPHA labs at CERN.



Ms. Pallavi Trivedi, 5th PhD student attended the "Collisionless Boltzmann (Vlasov) equations and modeling of self gravitating systems and plasmas", held during October 30 - November 3rd 2017 at CIRM, Marseille, France. She made an oral presentation entitled "*Vlasov simulations of Driven Electrostatic Phase Space Vortices in a 1-D electron-ion plasma*"



Dr. Mukesh Ranjan of FCIPT delivered an invited talk on "*Nano-patterning using plasma ions for cancer sensing applications*" at the 4th International Conference on Nano Structuring by Ion Beams (ICNIB-2017) held at the Devi Ahilya Vishwavidyalaya (DAVV), Indore during 11-13th October, 2017

Helicon Plasma Source (HeliPS) Laboratory @ CPP-IPR

A helicon plasma source setup with a glass source chamber, stainless steel expansion and extraction chambers has been established at CPP-IPR. This device has a 3 kW, 13.56 MHz RF source with a 500 Gauss, 6-coil electromagnet system and is supported by a 1200 l/s vacuum pumping system. This system produces Helicon plasma for studies on positive ion-negative ions and positive ion-electron plasma in electronegative gases. IPR collaborator is Dr. Mainak Bandyopadhyay.



The HeliPS Laboratory at CPP-IPR. Members : (L to R): Mr. N. Sharma (SRF), Dr. M. Chakraborty and Dr. N.K. Neog.

- ◆ **Dr. Sachin Sharma**, Gujarat Technological University, Ahmedabad, gave a talk on "Design and Development of Automatic Animal-Detection Algorithm Using Image Processing and Machine Learning Technique" on 2nd November 2017
- ◆ **Mr. Vara Prasad Kella**, Institute for Plasma Research, Gandhinagar, gave a talk on "Ion-flow driven instabilities in sheath-presheath of low temperature plasma" on 8th November 2017
- ◆ **Dr. Prince Alex**, Pondicherry University, Puducherry, gave a talk on "Study of Multiple Anodic Double Layers in Glow Discharge Plasma" on 13th November 2017
- ◆ **Dr. Kaushik**, Indian Institute of Technology Bombay, Mumbai, gave a talk on "Experimental investigation of the phenomena of laser produced plasma-induced shockwaves" on 14th November 2017
- ◆ **Mr. Agraj Abhishek**, Analytics Division, Institute for Plasma Research, Gandhinagar, gave a talk on "In-house Real Time CCTV Monitoring and Intrusion Detection Software Based on Deep Learning Techniques" on 16th November 2017
- ◆ **Dr. Tapan Barman**, Institute for Plasma Research, Gandhinagar, gave a talk on "Low cost fireball based splitted ion source for nanopatterning" on 17th November 2017
- ◆ **Mr. Bibhu Prasad Sahoo**, Institute for Plasma Research, Gandhinagar, gave a talk on "3D Monte-Carlo simulation of Aditya tokamak Scrape-off layer plasma transport with toroidally discontinuous limiters" on 17th November 2017
- ◆ **Dr. Subrata Pradhan**, Institute for Plasma Research, Gandhinagar, gave a talk on "Alumina-Embedded Mesoporous Silica Adsorption Characteristics of Molybdenum in Medical Radioisotope Applications" on 20th November 2017

Upcoming Events

- ◆ ISAMP Topical Conference on Quantum Collisions and Confinement of Atomic and Molecular Species and Photons, Tirupati, India, 06-08 January 2018 <http://www.iisertirupati.ac.in/isamp-tc7/>
- ◆ Annual meeting of the Spectroscopy and Dynamics Interest Group of the Royal Society of Chemistry (RSC-SDG 2018), Durham, UK., 08-10 January 2018 <http://www.verlet.net/sdg2018.html>
- ◆ 2018 Winter Conference on Plasma Spectrochemistry, Amelia Island, Florida, United States, 08- 13 January 2018 http://icpinformation.org/2018_Winter_Conference.html
- ◆ Physics in Food Manufacturing, University of Edinburgh, UK, 10-11 January 2018 <http://pifm2018.iopconfs.org/home>
- ◆ Anglo-French Physical Acoustics Conference 2018, Selsdon Park Hotel, 126 Addington Rd, South Croydon CR2 8YA, UK, 17-19 January 2018 <https://www.events.iop.org/e/anglo-french-physical-acoustics-conference-2018-122924389/page.html>
- ◆ 11th International Conference on Plasma Assisted Technologies (ICPAT-11), Abu Dhabi, UAE, 22-25 January 2018 <http://www.plasmacombustion.com/iwepac.html>
- ◆ Pacific Conference on Spectroscopy and Dynamics (PCSD 2018), San Diego, CA, USA., 25-28 January 2018 <https://www.westernspectroscopy.org/>
- ◆ 38th International Workshop on High Energy Density Physics with Intense Ion and Laser Beams, Hirschegg, Kleinwalsertal, Austria, 28 January - 02 February 2018 <https://indico.gsi.de/event/6348/>

Know Our Colleagues



Mr. Pramod R. Parmar joined IPR in 1998 in RF Division and involved from the conceptual designing to commissioning of in-vessel and out vessel LHCD systems and its supporting structures for its integration with SST and ADITYA . He contributed in the mock-up as well as final assembly of the system with SST-1. His designing works included structures for klystron base, high power component assembly and modified piping layout for optimum space utilisation for the LHCD UP gradation from 1MW to 2MW. He has contributed in the indigenous development of several important and sophisticated RF High power microwave components and also prepared in house set up for HDPE pipe joining and its hydro, pneumatic and vacuum testing for klystron collector cooling. He has also successfully carried out installation and commissioning of modified Hard X-ray structure on SST1 plat-form. He is presently involved in design, fabrication and testing of PAM launcher assembly, High Power Circulator Repair works, design and development of 3dB hybrid coupler prototype and its testing and vacuum window development activity. Also involved in design, development and fabrication of oversized wave guide component for ITER relevant system with CEA.

Dr. Sanjeev Kumar Sharma joined IPR as technical trainee in 1998 after completing his M.Sc. (physics) from M.M.H. College, Ghaziabad. In 1999, he started working with Neutral Beam Injector (NBI) group, where he has contributed to the development of various subsystems of NBI like ion source, neutraliser, gas-feed and vacuum systems. He has simulated neutral beam power profiles on various beam facing components, pressure profiles along the beam line and magnetic field profiles inside the ion source. He has performed several experiments on positive ion sources, cryo-condensation pumps and ion removal magnet with the objectives of estimating/enhancing their operational parameters. He has also participated in neutral beam injection experiments on DIII-D tokamak. In 2011, he received his Ph.D. from Kyushu University (Fukuoka, Japan) under the supervision of Professor Hideki Zushi. During his doctoral research, he experimentally studied various aspects of plasma wall interactions (PWI) like material damage, re-deposition, fuel retention and recycling in the spherical tokamak QUEST. He measured plasma driven hydrogen permeation (PDP) through metallic membranes and estimated atomic hydrogen flux near the first walls of the QUEST device.



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