

## TECHNICAL REPORTS (TR) 2022-23

Measurement of Thermal Strain in the Structural Material using a Strain Gauge and its Comparisons using the 2D-DIC Techniques

MAULIK PANCHAL, ABHISHEK SARASWAT, VRUSHABH LAMBADE, HARSH PATEL, KEDAR BHOPE, MAYUR MEHTA, SAMIR S. KHIRWADKAR and PARITOSH CHAUDHURI

IPR/TR-670/2022 (April 2022)

Development of HTS Tape Double Pancake Winding Machine

HEMANG AGRAVAT, PIYUSH RAJ, ARUN PANCHAL, PRATHMESH BHATT, UPENDRA PRASAD and R. SRINIVASAN

IPR/TR-671/2022 (April 2022)

Design and Development of Python Based Libraries to Access Multiple Instruments and Devices

RAMESH JOSHI, H. M. JADAV, SUNIL KUMAR and HIGH POWER ICRH SYSTEMS DIVISION

IPR/TR-672/2022 (April 2022)

Automated Plasma Probing System for Laboratory Experiments in High Vacuum Using Closed Loop Control

ROSH ROY, R. SUGANDHI, M. KUMAR and P. K. CHATTOPADHYAY

IPR/TR-673/2022 (April 2022)

Testing and Validation of Standard Bi-Metallic (SS-Al) Pipe Joints for LIGO Application

NARESH CHAND GUPTA, ANANTA KUMAR SAHU, KEDAR BHOPE, MAYUR M. MEHTA, RAJNIKANT BHATTASANA and OMKAR CHANDRATRE

IPR/TR-674/2022 (May 2022)

Standalone Software Configuration for CDS Test Rack

HITESH K. GULATI, ARNAB DASGUPTA and AMIT K. SRIVASTAVA

IPR/TR-675/2022 (May 2022)

Coaxial Tungsten Hot Plate-Based Cathode Source for Cesium Plasma Production Confined in MPD Device

A. D. PATEL, ZUBIN SHAIKH, M. SHARMA, SANTOSH P. PANDYA and N. RAMASUBRAMANIAN

IPR/TR-676/2022 (May 2022)

RF Communication with Salt Water Standing Column and Water Jet

A. SARADA SREE and RAJESH KUMAR

IPR/TR-677/2022 (May 2022)

Engineering Design Report of Prototype Center Stack

ADITYA KUMAR VERMA, RANJITH KUMAR, PRASAD RAO PEDADA, SHIJU SAM, Y. S. S. SRINIVAS and E. RAJENDRA KUMAR

IPR/TR-678/2022 (May 2022)

Finite Element Simulation for Validation of Multi-Dipole Line Cusp Magnetic Field Configuration for MPD

A. D. PATEL, A. AMARDAS and N. RAMASUBRAMANIAN

IPR/TR-679/2022 (June 2022)

Linux Based High Speed Embedded Data Acquisition System for Long Pulse Discharge in Aditya-U Tokamak

PRAMILA GAUTAM, HITESH MANDALIYA, VISMAYSINH RAULJI and RACHANA RAJPAL

IPR/TR-680/2022 (June 2022)

Finite Element Analyses of Double Sided LIM for EML

ANANYA KUNDU, PRASAD RAO PEDADA, ANKUR JAISWAL, ARVIND KUMAR, Y. S. S. SRINIVAS, VILAS CHAUDHARI, RAMBABU SIDIBOMMA and E. RAJENDRA KUMAR

IPR/TR-681/2022 (June 2022)

Upgrade Data Acquisition Module for ICRH Transmission Line DAC System

RAMESH JOSHI, H. M. JADAV, SUNIL KUMAR and HIGH POWER ICRH SYSTEMS DIVISION

IPR/TR-682/2022 (June 2022)

Design, Development and Automation of Multi-Channel Detector Bias Voltage Electronics for Thomson Scattering Experiment

V. CHAUDHARI, PABITRA MISHRA, NEHA SINGH, JINTO THOMAS and H. C. JOSHI

IPR/TR-683/2022 (June 2022)

Characterization of Single Stage Superheterodyne Circuit for Ka-Band FMCW Reflectometry

ROHIT MATHUR, JJU. BUCH, VISHNU CHAUDHARY and S. K. PATHAK

IPR/TR-684/2022 (June 2022)

Design of Exhaust System for Tritium Handling and Recovery System of Accelerator Based 14 MeV Neutron Generator

SUDHIR TRIPATHI, MITUL ABHANGI, H. L. SWAMI, SUDHIR VALA AND MANOJ K. GUPTA

IPR/TR-685/2022 (June 2022)

Conceptual Design and Preliminary Data Analysis for Classification of Plasma Disruption Event at Aditya-U Tokamak

RAMESH JOSHI, JOYDEEP GHOSH, NILESH KALANI, R. L. TANNA and ADITYA/ADITYA-U TEAMS

IPR/TR-686/2022 (June 2022)

Design & Automation of Heater Controller Power Supply For Heating the High Temperature Black Body Source

BHARATKUMAR ARAMBHADIYA, VISMAYSINH RAULJI, RACHANA RAJPAL, VARSHA SIJU, KARISHMA PANDYA, PRAVEENA SHUKLA and S. K. PATHAK

IPR/TR-687/2022 (June 2022)

Optimization of Layer Pattern of Regenerator for a Low-Frequency Pulse-Tube Cryocooler

ABHINAV B. DESAI, ROHAN DUTTA, HEMANG AGRAVAT, VISHAL GUPTA, SHASHI K. VERMA, AVIJIT DEWASI, SAMIRAN MUKHERJEE, JYOTI S. MISHRA, PARESH PANCHAL, PRATIK A. NAYAK and RANJANA GANGRADEY

IPR/TR-688/2022 (June 2022)

Optimization of Ion Source Operation using the Electrical Diagnostics for Steady State Superconducting Tokamak-1 Neutral Beam Test Stand

KARISHMA QURESHI, PARESH PATEL, LAXMIKANT BANSAL, VIJAY VADHER, DIPAL THAKKAR, C. B. SUMOD, LAXMINARAYAN GUPTA and UJJWAL BARUAH

IPR/TR-689/2022 (July 2022)

Design and Development of LN<sub>2</sub> Cooled Cryopump for Application in High Heat Flux Test Facility

S. S. MUKHERJEE, V. GUPTA, P. PANCHAL, J. S. MISHRA, P. NAYAK, J. AGARWAL, H. AGRAVAT, A. DEWASI, R. DUTTA, A. DESAI, S. K. VERMA, R. SWAMY, P. MOKARIYA, N. PATEL, T. PATEL, S. M. BELSARE, S. S. KHIRWADKAR and R. GANGRADEY

IPR/TR-690/2022 (July 2022)

Digital Signal Processing Simulation for Plasma Electron Density Measurement on FPGA

KIRAN PATEL, UMESH NAGORA, H. C. JOSHI and SURYA PATHAK

IPR/TR-691/2022 (July 2022)

Sensors Installation, Signal Conditioning Electronics and PXI Based Data Acquisition System Operation for Nb<sub>3</sub>Sn Solenoid

PANKAJ VARMORA, BHADRESH PARGHI, MONI BANAUDHA, PIYUSH RAJ, ARVIND TOMAR, MAHESH GHATE, AZAD MAKWANA, ARUN PANCHAL, DHAVAL BHAVSAR, NITISH KUMAR, ANEES BANO, ROHIT PANCHAL, DASARATH SONARA, RAKESH PATEL, HIREN NIMAVAT, GAURANG MANSURIA, CHRISTIAN DIKENS, ATUL GARG, GAURAV PURVAR, VIPUL TANNA, RAJU DANIEL and UPENDRA PRASAD

IPR/TR-692/2022 (July 2022)

Transmission Characteristics of Plasma-Based Microwave Absorbing Panel in Near and Far Field Region of Testing Antenna

N. RAJAN BABU, HIRAL B. JOSHI, AGRAJIT GAHLAUT, SAGAR SHAH, RAJESH KUMAR and ASHISH R. TANNA

IPR/TR-693/2022 (July 2022)

Design of New Target Handling System, Extension Chamber and Modifications to the Existing Target Handling System of High Heat Flux Test Facility

RAJAMANNAR SWAMY, S. S. KHIRWADKAR, NIKUNJ PATEL, VINAY MENON, KEDAR BHOPE, SUNIL BELSARE, PRAKASH MOKARIA and TUSHAR PATEL

IPR/TR-694/2022 (August 2022)

Design and Testing of 0.35/25 kV, 20 kHz Transformers for Nuclear Applications  
ARITRA CHAKRABORTY, PAUL CHRISTIAN, AMAL S., SAURABH KUMAR, ANANYA KUNDU,  
ASHOK MANKANI and UJJWAL KUMAR BARUAH  
IPR/TR-695/2022 (August 2022)

Development and Application of Vibration Diagnostics for Condition Monitoring in High Heat Flux Test Facility  
at IPR  
KEDAR BHOPE, MAYUR MEHTA, SUNIL BELSARE, SAMIR KHIRWADKAR, VINAY MENON,  
RAJAMANNAR SWAMY, PRAKASH MOKARIYA, TUSHAR PATEL and NIKUNJ PATEL  
IPR/TR-696/2022 (August 2022)

Phase-I Design of Data Acquisition and Control System of Large Scale Cryogenics Plant System  
V. B. PATEL, A. K. SAHU, A. L. SHARMA, H. H. CHUDASMA, H. MASAND, H. J. DAVE, I. A. MANSURI,  
J. J. PATEL, M. K. BHANDARKAR, O. CHANDRATRE, P. GADDAM, P. SINGH, T. S. RAO, K. MAHAJAN  
and LCPC TEAM  
IPR/TR-697/2022 (September 2022)

First MHD Experiments at IPR in LLMHD Loop  
A. PATEL, S. VERMA, A. SARASWAT, P. SATYAMURTHY, S. MALHOTRA, R. BHATTACHARYAY, S.  
GUPTA, A. PRAJAPATI, M. KUMAR, T. S. RAO, A. MAKWANA, D. SHARMA, A. JAISWAL, D.  
MOHANTA, S. K. SHARMA, V. VASAVA, H. TAILOR, A. DEOGHAR, S. SAHU, U. PRASAD, A. RANJAN  
and S. RANJITH KUMAR  
IPR/TR-698/2022 (September 2022)

Design and Analysis of Heat Exchanging Elements, Cold-End Heat Exchanger cum Flow Straighteners, and Hot-  
End Heat Exchanger of a Pulse Tube Cryocooler Constrained by Fluid Dynamics  
ABHINAV B. DESAI, ROHAN DUTTA, HEMANG AGRAVAT, AVIJIT DEWASI, VISHAL GUPTA,  
SAMIRAN MUKHERJEE, JYOTIS. MISHRA, PARESH PANCHAL, PRATIK A. NAYAK and RANJANA  
GANGRADE  
IPR/TR-699/2022 (September 2022)

Flood Modelling Simulation: A Feasibility Study Using Open Source Code  
SHAILJA TIWARI, MANIKA SHARMA and SHASHANK CHATURVEDI  
IPR/TR-700/2022 (September 2022)

Immersive Virtual Reality Applications to Train Operators for Emergency Preparedness  
NAVEEN RASTOGI, KRISHAN KUMAR GOTEWAL, RAVI RANJAN KUMAR, MANOAH STEPHEN  
MANUELRAJ and JIGNESH CHAUHAN  
IPR/TR-701/2022 (September 2022)

Conceptual Design of Open Source IoT Based Software Solution for Cryogenic Experiments  
RAMESH JOSHI, H. M. JADAV, SUNIL KUMAR and VISHNU PATEL  
IPR/TR-702/2022 (October 2022)

Concept Development and Prototyping of End Connections for Flexible Cryostat towards Testing of HTS Cables  
MAHESH GHATE, NAYAN SOLANKI, VIJAY VASAVA, SURENDRASINH JADEJA, FIROZKHAN  
PATHAN, DEVEN KANABAR, PIYUSH RAJ, UMESH PAL, ANEES BANOO, DHAVAL BHAVSAR and  
UPENDRA PRASAD  
IPR/TR-703/2022 (October 2022)

Development of Automated Calibration Setup for Ultra-Wide Band Microwave Source for Reflectometry  
Diagnostic  
VISHNU CHAUDHARY, J.J.U. BUCH and S. K. PATHAK  
IPR/TR-704/2022 (October 2022)

Investigating the Effect of Density Variation on Pitch Angle Scattering Events of Runaway Electrons as Observed  
Through Electron Cyclotron Emission Diagnostic at Aditya-Upgrade Tokamak  
VARSHA SIJU, SANTOSH P. PANDYA, S. K. PATHAK, UMESH NAGORA, JAYESH RAVAL, SHISHIR  
PUROHIT, ANSH PATEL, M. K. GUPTA, K. TAHILIANI, R. L. TANNA, KUMARPALSINH JADEJA,  
ROHIT KUMAR and J. GHOSH  
IPR/TR-705/2022 (October 2022)

Conceptual Design of a Microwave Cavity Perturbation Based System for Teflon and Nylon Pellets Mass Measurement

ROHIT KUMAR SAINI, JYOTI SHANKAR MISHRA and RANJANA GANGRADEY

IPR/TR-706/2022 (October 2022)

Developing Scalable Parallel Applications using Small and Low-Cost Testbed Cluster of Single Board Computers

DEEPAK AGGARWAL, ARKAPRAVA BOKSHI and DEEP LAD

IPR/TR-707/2022 (October 2022)

Design, Fabrication, and Testing of 0.2 T High-Temperature Superconducting Solenoid Coil with Room Temperature Bore Cryostat

UPENDRA PRASAD, MAHESH GHATE, PIYUSH RAJ, DEVEN KANABAR, ANEES BANOO, ARUN PANCHAL, DHAVAL BHAVSAR, UMESH PAL, NAYAN SOLANKI, HEMANG AGRAVAT, ARVIND TOMAR, NITISH KUMAR, BHADRESH PARGHI, PANKAJ VARMORA, FIROZKHAN PATHAN, ARUN PRAKASH, SHIJU GEORGE and MSD

IPR/TR-708/2022 (October 2022)

Preliminary Design of the MHD Test Mock up with Complex Flow Configuration

A. PATEL, R. KUMAR, S. VERMA, A. PRAJAPATI, A. SARASWAT and R. BHATTACHARYAY

IPR/TR-709/2022 (November 2022)

Experience of Pumping the Vacuum Vessel of SST-1 during the Baking Cycle with Indigenously Developed Liquid Nitrogen Cooled Sorption Pump

VISHAL GUPTA, SAMIRAN S. MUKHERJEE, AVIJIT DEWASI, JYOTI SHANKAR MISHRA, PRATIK A. NAYAK, PARESH PANCHAL, VIPUL L. TANNA, YUVAKIRAN PARAVASTU, DILIP C. RAVAL, ZIAUDDIN KHAN, RAJU DANIEL, SIJU GEORGE, ATUL GARG, L. N. SRIKANTH, KALPESH R. DHANANI, ROHAN DUTTA, ABHINAV B. DESAI, HEMANG S. AGRAVAT and RANJANA GANGRADEY

IPR/TR-710/2022 (December 2022)

Wire-Burn Test Results of HVPS2 for Output Stage and HVPS1 for Driver Stage Power Supplies of 1.5MW RF Generator

BHAVESH KADIA, KIRIT PARMAR, GAJENDRA SUTHAR, HITESH DHOLA, DISHANG UPADHYAY, KISHORE MISHRA, RAGHURAJ SINGH, RAJESH TRIVEDI, N.P. SINGH, SUNIL KUMAR and IPR ICRH & ITER-INDIA POWER SUPPLY GROUPS

IPR/TR-711/2023 (January 2023)

Development of Prototype Power Supply for Ohmic Transformer System of SSST

URMIL THAKER, VAIBHAV RANJAN and SUPRIYA NAIR

IPR/TR-712/2023 (January 2023)

Development of a Test Set Up for HTS Sample Characterization Using Solid Nitrogen

NITISH KUMAR, ARVIND TOMAR, ANEES BANO, PIYUSH RAJ, PANKAJ VARMORA, BHADRESH PARGHI, MONI BANAUDHA, CHIRAG DODIYA, V. L. TANNA, RAJU DANIEL and UPENDRA PRASAD

IPR/TR-713/2023 (January 2023)

Study of Capture Fraction of Water by Cryopump for LI-VISTA Test Bed Using Molflow Tool

S. AHMED, S. SUNIL and S. MUKHERJEE

IPR/TR-714/2023 (January 2023)

Development and Validation of Room Temperature Bore Cryostat for Testing of HTS Solenoid Magnet up to 55 K

MAHESH GHATE, DHAVAL BHAVSAR, HEMANG AGRAVAT, NAYAN SOLANKI, DEVEN KANABAR, PIYUSH RAJ, ANEES BANO, UMESH PAL, FIROZKHAN PATHAN, ARUN PANCHAL, ARVIND TOMAR, NITISH KUMAR, ARUN PRAKASH, SIJU GEORGE, ZIAUDDIN KHAN and UPENDRA PRASAD

IPR/TR-715/2023 (January 2023)

Optimization of Centralized LN<sub>2</sub>, GN<sub>2</sub> Distribution for New Lab at IPR

NARESH CHAND GUPTA, VIPUL TANNA, ANANTA KUMAR SAHU, RANJANA GANGRADEY and NITIN SHAH

IPR/TR-716/2023 (January 2023)

Performance Study of ANU-400 Turbomolecular Pump

PRATIBHA JAKHMOLA, KALPESH R. DHANANI, DILIP C. RAVAL, ZIAUDDIN KHAN, SHASHANK CHATURVEDI, NAYAN B. KOLI, B. L. MEENA, J. A. BHOSALE, S. G. BOBADE, S. S. THAKUR, R. K. CHOUDHARY, LALCHAND, PRABHAT RANJAN, MUNENDRA SINGH, BRAJPAL, KANCHAN GARAIN, SAUMITRA PAL, PRADIP H. CHAVDA and A. K. WANKHEDE

IPR/TR-717/2023 (January 2023)

Implementation of SOLPS5.1 to SST-1 and ADITYA-U Tokamak

ANIL KUMAR TYAGI, M. HIMABINDU, DEEPTI SHARMA and DEVENDRA SHARMA

IPR/TR-718/2023 (January 2023)

Development of Deep Learning Models for Time Series Analysis for Predicting Future Sequence of Signals at Aditya-U Tokamak

RAMESH JOSHI, JOYDEEP GHOSH, NILESH KALANI, R. L. TANNA and ADITYA/ADITYA-U TEAMS

IPR/TR-719/2023 (February 2023)

Design and Testing of Thermo-Electric Cooler Controller for Detection

Sub-System of Thomson Scattering Diagnostic

VISHNU CHAUDHARI, NEHA SINGH, PABITRA MISHRA and JINTO THOMAS

IPR/TR-720/2023 (February 2023)

Applied Plasma Physics Experiments in Linear (APPEL) Device and Its First Plasma Characterization for Plasma Surface Interaction Studies

Y. PATIL and S. K. KARKARI

IPR/TR-721/2023 (February 2023)

Hazard & Operability (HAZOP) Study Report of Thermic Fluid System

ANKUSH V. DEOGHAR, SHRIKANT VERMA, ABHISHEK SARASWAT, RUDREKSH PATEL, ANITA PATEL, ANKIT GANDHI and RAJENDRAPRASAD BHATTACHARYAY

IPR/TR-722/2023 (March 2023)

High Heat Flux Testing of Brazed W/CuCrZr Mono-Block in HHFTF

KEDAR BHOPE, VINAY MENON, SUNIL BELSARE, SAMIR KHIRWADKAR, RAJAMANNAR SWAMY, MAYUR MEHTA, K.P. SINGH, TUSHAR PATEL, NIKUNJ PATEL and PRAKASH MOKARIYA

IPR/TR-723/2023 (March 2023)

Periodic Hydrostatic Testing, Inspection and Certification of Helium Gas Cylinders

RAJIV SHARMA, HIREN NIMAVAT, PANKIL SHAH, KETAN PATEL, L. N. SRIKANTH and V. L. TANNA

IPR/TR-724/2023 (March 2023)

Review of Cockcroft-Walton High Voltage Low Current DC Power Supplies

URMIL THAKER and SANTOSH C. VORA

IPR/TR-725/2023 (March 2023)

Investigation of Impulse Voltage Test of Ohmic Coil System in ADITYA-U Tokamak

ROHIT KUMAR, R. L. TANNA, TANMAY MACWAN, S. AICH, HARSHITA RAJ and J. GHOSH

IPR/TR-726/2023 (March 2023)

Finite Element Analysis of Scintillator Crystal Temperature Rise for ITER HXR-Monitor due to the Radiation Flash Load Following the Activation of the Disruption Mitigation System

HARDIK MISTRY, SANTOSH P. PANDYA, BRAJ KISHORE SHUKLA, KUMUDNI TAHILIANI, SURYA KUMAR PATHAK, RICHARD O'CONNOR and TIEULENT RAPHAEL

IPR/TR-727/2023 (March 2023)

Design Report of Tin-Lithium (Sn-Li) Alloy Production Facility

SHAILESH KANPARA, ALPESH PATEL, VINAY MENON, SUNIL BELSARE, KEDAR BHOPE, ANKUSH DEOGHAR, TUSHAR PATEL, NIKUNJ PATEL and SAMIR KHIRWADKAR

IPR/TR-728/2023 (March 2023)

Electromagnetic and Structural Analysis of in-vessel Coils of SST-1

A. AMARDAS

IPR/TR-729/2023 (March 2023)