

## **TECHNICAL REPORTS (TR) 2023-24**

Material Characterization using Vector Network Analyser & Determination of Dielectric Properties  
RIMJHIM RAJPUT, ABHISHEK SINHA, VARSHA SIJU and S. K. PATHAK  
IPR/TR-730/2023 (April 2023)

Conceptual Design of 3T High Temperature Superconducting Magnet  
UPENDRA PRASAD, DEVENKUMAR KANABAR, PIYUSH RAJ, MAHESH GHATE, PANKAJ  
VARMORA, SWATI ROY, ARUN PANCHAL, DHAVAL BHAVSAR and VIPUL TANNA  
IPR/TR-731/2023 (May 2023)

Energy calibration of Silicon Drift Detector based Spectrometer for ADITYA-U Plasma start-up studies  
Y.TAUNK, S. PUROHIT, M.K. GUPTA, K. GARG  
IPR/TR-732/2023 (May 2023)

Procedure of Helium Turbine Assembly with Cold Box, Pressure Test and Leak Test  
O.CHANDRATRE and A. K. SAHU  
IPR/TR-733/2023 (May 2023)

3D-DIC Technique for out-of-Plane Displacements: Its Validation and Application  
KEDAR BHOPE, MAYUR MEHTA, SAMIR KHIRWADKAR, NIKUNJ PATEL, PRAKASH MOKARIYA  
and TUSHAR PATEL  
IPR/TR-734/2023 (May 2023)

In-House Break-Down Maintenance of Imported Cryo-Pump  
VINOD D. KAILA, LAVKESH LACHHVANI, VIJAY PATEL, SUDHIR TRIPATHI, MANOJ K.GUPTA,  
NIKHIL MOHURLE, YOGESH YEOLE, MANU BAJPAI, PRABAL K. CHATTOPADHYAY and K. A.  
JADEJA  
IPR/TR-735/2023 (May 2023)

Assessment of Stacked LSTM, Bidirectional LSTM, ConvLSTM2D and Auto Encoders LSTM Time Series  
Regression Analysis at Aditya-U Tokamak  
RAMESH JOSHI, JOYDEEP GHOSH, NILESH KALANI, R. L. TANNA and ADITYA/ADITYA-U TEAMS  
IPR/TR-736/2023 (May 2023)

Development of Compound Pendulum Based Thrust Diagnostic for Helicon Plasma Thruster  
RENU BAHL, BHOO MI KHODIYAR, MRITUNJAY KUMAR, NARENDER SINGH, BUDDU RAMESH  
KUMAR and PRABAL KUMAR CHATTOPADHYAY  
IPR/TR-737/2023 (May 2023)

A Simulation Analysis of 30 kV / 5A DC Power Supply for Neutral Beam Injectors  
ADITYA NAUGRAIYA, ARITRA CHAKRABORTY, KUMAR SAURABH, ASHOK MANKANI  
IPR/TR-738/2023 (June 2023)

Two-Dimensional Steady-State Thermal Analysis of PINI Ion Source Back Plate Under High Heat Flux  
Condition  
TEJENDRA PATEL, MUKTI RANJAN JANA, UJJWAL BARUAH  
IPR/TR-739/2023 (June 2023)

Comparison of inference implementation on Raspberry pi and Jetson Nano for deep learning model at  
ADITYA-U  
RAMESH JOSHI, JOYDEEP GHOSH, NILESH KALANI AND R. L. TANNA  
IPR/TR-740/2023 (June 2023)

Analysis of different inference implementations for deep learning model on ADITYA-U tokamak  
RAMESH JOSHI, JOYDEEP GHOSH, NILESH KALANI AND R. L. TANNA  
IPR/TR-741/2023 (June 2023)

Design, fabrication and assembly of a two-phase detection sensor array for molten lead (Pb) based heavy metal coolants

ABHISHEK SARASWAT, RAJENDRAPRASAD BHATTACHARYAY AND SATEESH GEDUPUDI  
IPR/TR-742/2023 (July 2023)

Design and development of Hydrogen Isotopes Extraction System at IPR

RUDREKSH B. PATEL, PRAGNESH B. DHORAJIYA, SUDHIR RAI, P. A. RAYJADA, DEEPAK SHARMA, ADITYA VERMA, AMIT SIRCAR, RAJENDRA BHATTACHARYAY, PARITOSH CHAUDHURI  
IPR/TR-743/2023 (July 2023)

Indigenous Development of Epoxy Resin System for Cryogenic Services and Fusion Application

RAJIV SHARMA, ALKESH M MAVANI and V L TANNA  
IPR/TR-744/2023 (July 2023)

Development and Measurements Using Diamagnetic Loop in Aditya-U Tokamak

S. AICH, T. M. MACWAN, K. GALODIYA, K. SINGH, S. DOLUI, J. GHOSH, R. L. TANNA, L. K. PRADHAN, ABHIJEET KUMAR, H. MANDLIYA, PRAVEENLAL E. V., B. HEGDE, R. KUMAR, A. KUMAR, A. KUMAWAT, K. A. JADEJA, K. PATEL, A. PATEL and ADITYA-U TEAM  
IPR/TR-745/2023 (July 2023)

A CFD Analysis of the Rotating Target Holder of the 4-MeV Neutron Generator

SNEHAL JAYSWAL, MANOJ KUMAR GUPTA, SUDHIRSINH VALA, RATNESH KUMAR, RAJESH KUMAR  
IPR/TR-746/2023 (July 2023)

Monitoring the Behaviour of Electromagnetic Coil Insulation under Varying Operational conditions in ADITYA-U Tokamak

ROHIT KUMAR, HARSHITA RAJ, LAXMIKANTA PRADHAN, SUMAN AICH, KAUSALENDER SINGH, SUMAN DOLUI, ANKIT KUMAR, BHARAT HEGDE, ASHOK KUMAWAT, R.L TANNA, and J. GHOSH  
IPR/TR-747/2023 (July 2023)

Design of Liquid Nitrogen Cooled Large Size Cryopump

HEMANG S. AGRAVAT, SAMIRAN S. MUKHERJEE, VISHAL GUPTA, PARESH PANCHAL, PRATIK NAYAK, JYOTI SHANKAR MISHRA, RANJANA GANGRADEY  
IPR/TR-748/2023 (July 2023)

Design and Characterization of High Temperature Black Body Source in Microwave-Millimetre wave Spectrum for radiometric calibration

VARSHA SIJU, S.K.PATHAK  
IPR/TR-749/2023 (August 2023)

Remote Plasma Experiment (2023)

SNEHARSH BELSARE, K. K. MOHANDAS, PRASHANT KUMAR, A. V. RAVI KUMAR  
IPR/TR-750/2023 (August 2023)

Implementation and Validation of Drift Free Integrators

PRAVEENA KUMARI, RACHANA RAJPAL, VISMAYSINH RAULJI, SAMEER JHA, KUMUDNI TAHILIANI, DANIEL RAJU  
IPR/TR-751/2023 (August 2023)

Hazard & Operability (HAZOP) Study Report of Lead Lithium Loop

ANITA PATEL, SHRIKANT VERMA, ABHISHEK SARASWAT, RUDREKSH PATEL, ANKUSH V. DEOGHAR, ANKIT GANDHI, RAJENDRAPRASAD BHATTACHARYAY  
IPR/TR-752/2023 (August 2023)

Performance Results of Upgraded Cryogenic System with 4 Cryo-condensation Pumps During 0.2 to 0.7 MW Positive Neutral Beam Operation

CH. CHAKRAPANI, B. SRIDHAR, B. CHOKSI, L.K. BANSAL, VIJAY VADHER, KARISHMA Q, SANJAY L PARMAR, NILESH CONTRACTOR, VISHNU PATEL, BHARGAV PANDYA, V. PRAHLAD, PARESH PATEL, and U.K.BARUAH  
IPR/TR-753/2023 (August 2023)

Two-Dimensional Digital Image Correlation Technique for Different Applications

MAYUR MEHTA, KEDAR BHOPE, S. S. KHIRWADKAR, N.C. GUPTA, JIGNESH CHAUHAN, HARDIK TAILOR, MAULIK PANCHAL, ABHISHEK SARASWAT, PARITOSH CHAUDHURI, A, K. SAHU, SUNIL BELSARE, TUSHAR PATEL  
IPR/TR-754/2023 (August 2023)

Design, Simulation and Implementation of Structural Support for Cylindrical High Temperature Reactor

ATIKKUMAR N. MISTRY, HEMANG AGRAVAT, VISHAL JAIN, S.K. NEMA  
IPR/TR-755/2023 (August 2023)

3D MHD Flow Analysis in a Circular Duct with Different Wall Electrical Conductivity

A. PATEL, R. BHATTACHARYAY  
IPR/TR-756/2023 (August 2023)

Development and Testing of a Pneumatic Mechanical Punch for Application in Cryogenic Pellet Injection

PARESH PANCHAL, J S MISHRA, HEMANG AGRAVAT, SAMIRAN MUKHERJEE, MONI BANAUDHA, RANJANA GANGRADEY  
IPR/TR-757/2023 (August 2023)

Electrical and thermal property measurement of the cement coated graphite

K.P SINGH, SAMIR S KHIRWADKAR, PRIYANKA PATEL, ALPESH PATEL, SIJU GEORGE, KEDAR BHOPE, SMIT GAJJAR, PRAKASH MOKARIA, VYOM DESAI  
IPR/TR-758/2023 (August 2023)

Eddy Current Testing for Non-destructive testing of Plasma Facing Components

KEDAR BHOPE, MAYUR MEHTA, SAMIR KHIRWADKAR  
IPR/TR-759/2023 (August 2023)

Numerical Computation of Electric Field Distribution for HVDC Systems at R&D Facilities

ARITRA CHAKRABORTY, AMAL S, SAURABH KUMAR, PAUL D. CHRISTIAN, ADITYA NAUGRAIYA, ASHOK MANKANI and UJJWAL KUMAR BARUAH  
IPR/TR-760/2023 (August 2023)

Parametric Analysis of Receiver Radio Frequency Section for Reflectometry Diagnostic Using MATLAB

VISHNU CHAUDHARY, JJU BUCH, and S.K. PATHAK  
IPR/TR-761/2023 (September 2023)

An approach for control of equilibrium field profile through the real-time plasma current in ADITYA-U and SST-1 tokamaks

SHIVAM KUMAR GUPTA, KUNAL S SHAH, M N MAKWANA, ROHIT KUMAR, R L TANNA, JASRAJ DHONGDE, AVEG KUMAR, B V NAIR, S NAIR, JOYDEEP GHOSH, D RAJU  
IPR/TR-762/2023 (September 2023)

Design and Analysis of Cryostat System for the Testing of 3T-HTS Magnet

PRABAL BISWAS, SUDHIR TRIPATHI, MANOJ K. GUPTA, SWADESH PATNAIK, SNEHAL JAYSWAL, MAHESH M. GHATE, DEVEN KANABAR, PIYUSH RAJ, SWATI ROY, PANKAJ VARMORA, UPENDRA PRASAD  
IPR/TR-763/2023 (September 2023)

Design, Simulation, Analysis, Fabrication and Testing of Toroidal Field Power Supply (TFPS) for Simple Tight Aspect Ratio Machine Assembly

SUPRIYA A. NAIR, URMIL THAKER, and TULCHHI RAM  
IPR/TR-764/2023 (October 2023)

Calibration and Power Measurement Experiments for 95 GHz Water Cooled Dummy Load  
HARDIK MISTRY, HARSHIDA PATEL, NANI MEDICHERLA, P SRIKRISHNA, JATIN PATEL,  
DHARMESH PUROHIT, K G PARMAR, SANTANU KARMAKAR and B. K. SHUKLA  
IPR/TR-765/2023 (October 2023)

Development of Tool for Sign Language to Text Conversion  
A. SHARMA, A. ABHISHEK, M. SHARMA  
IPR/TR-766/2023 (October 2023)

Artificial Intelligence based Face Recognition: Advancements and Applications  
A. ABHISHEK, A. SHARMA, M. SHARMA  
IPR/TR-767/2023 (October 2023)

Conceptual Design of Cryostat system used for testing of 3T-HTS Magnet  
PRABAL BISWAS, SUDHIR TRIPATHI, MAHESH M. GHATE, MANOJ K. GUPTA, SWADESH  
PATNAIK, SNEHAL JAYSWAL, DEVEN KANABAR, PIYUSH RAJ, SWATI ROY, PANKAJ VARMORA,  
UPENDRA PRASAD  
IPR/TR-768/2023 (October 2023)

Improved Horizontal Plasma Position Control Using c-RIO Based Real Time System in Aditya-U  
PRAMILA GAUTAM, VISMAYSINH RAULJI, ROHIT KUMAR, RACHANA RAJPAL, RAKESH TANNA,  
JOYDEEP GHOSH, and ADITYA-U TEAM  
IPR/TR-769/2023 (October 2023)

Control System Architecture for Integrated and Simultaneous Operation of Multiple Probe Drives for an  
Experimental Plasma System  
JIGNESH PATEL, ROSH ROY, KALPESH DOSHI, TANMAY KARMAKAR, IMRAN MANSURI,  
MANISHA BHANDARKAR, KIRTI MAHAJAN and PRABAL CHATTOPADHYAY  
IPR/TR-770/2023 (October 2023)

On-site Determination of Effective Turn-Area of Magnetic Probes for Aditya-U Tokamak  
SAMEER KUMAR, KUMUDNI TAHILIANI, PRAVEENA KUMARI, PRAVEENLAL EDAPPALA, I  
SURESH, KUNAL S SHAH, DANIEL RAJU, RACHNA RAJPAL, SURYA KUMAR PATHAK, ROHIT  
KUMAR, RAKESH L TANNA, HARSHITA RAJ, JOYDEEP GHOSH and ADITYA-U TEAM  
IPR/TR-771/2023 (November 2023)

Design and Simulation of High Temperature Thermally Insulated Chamber to Operate Graphite Electrode Based  
Plasma Arc  
ATIKKUMAR N. MISTRY, DEEPAK SHARMA, HEMANG AGRAVAT, VISHAL JAIN, S.K NEMA  
IPR/TR-772/2023 (November 2023)

Design, In-House Fabrication and Mounting of Optical Fibre Mount-cum-Optical Filter Holder  
SUMAN AICH, SARVIL PATEL, LAXIMIKANTA PRADHAN, MALAY BIKAS CHOWDHURI and  
JOYDEEP GHOSH  
IPR/TR-773/2023 (November 2023)

Investigating the Occurrence and Predictability of Pitch Angle Scattering Events at Aditya-Upgrade Tokamak  
with the Electron Cyclotron Emission Radiometer  
VARSHA SIJU, SANTOSH P. PANDYA, S. K. PATHAK, ANSH PATEL, UMESH NAGORA, SHISHIR  
PUROHIT, SAMEER JHA, M. K. GUPTA, K. TAHILIANI, R. KUMAR, R. L. TANNA, J. GHOSH and  
ADITYA-U TEAM  
IPR/TR-774/2023 (November 2023)

Technical Feasibility of LabVIEW based Data Acquisition software for Fourier Transform Spectrometer  
VISMAYSINH RAULJI, BHARATKUMAR ARAMBHADIYA, RACHANA RAJPAL, NARESH KALVANI,  
RAVINDER KUMAR, SHIVAKANT JHA, SUMAN DANANI, HITESH PANDYA, SUBROTO  
MUKHERJEE  
IPR/TR-775/2023 (November 2023)

Establishment of a New Research and Development Facility for Exhaust Gas Treatment  
K. NIGAMA, B. SAHOO, A. BORUAH, C. PATIL, G. RAVI  
IPR/TR-776/2023 (December 2023)

Ethernet Based Controller for Analog Signal Conditioning Electronics  
MINSHA SHAH, PRAVEENLAL EDAPPALA, RACHANA RAJPAL  
IPR/TR-777/2023 (December 2023)

Data Acquisition and Trigger system for CRDS diagnostic in Negative Ion Source  
HIMANSHU TYAGI, DEBRUP MUKHOPADHYAY, RATNAKAR YADAV, HIREN MISTRI, KAUSHAL  
PANDYA, MANAS BHUYAN, MAINAK BANDYOPADHYAY, MJ SINGH, ARUN CHAKRABORTY  
IPR/TR-778/2023 (December 2023)

Event driven High Speed Data Acquisition with IEEE 1588 synchronization for long pulse operations of Indian  
Test Facility for ITER DNB  
H TYAGI, R K YADAV, M BHUYAN, M BANDYOPADHYAY, MJ SINGH and ARUN CHAKRABORTY  
IPR/TR-779/2023 (December 2023)

Viewing Geometry Impact over the Tomographic Reconstructions and Magnetic Island Measurement  
S. PUROHIT, M.K. GUPTA  
IPR/TR-780/2023 (December 2023)

Commissioning and Initial Operational Experience of 2 MW AC/DC Power Converter at IPR for Neutral Beam  
Injector Applications  
ARITRA CHAKRABORTY, SAURABH KUMAR ASHOK MANKANI, AMAL S, PAUL D. CHRISTIAN  
and UJJWAL KUMAR BARUAH  
IPR/TR-781/2023 (December 2023)

Residual Life Enhancement of 2 Nos. of 15MVA and 1 No. of 31.5MVA, 132/11kV Power Transformers at  
132kV IPR Substation  
PRAKASH PARMAR, CHANDRA KISHOR GUPTA, SUPRIYA NAIR, CHIRAG BHAVSAR  
IPR/TR-782/2023 (January 2024)

Electron Beam Profile Measurement using enhanced dual-techniques in High Heat Flux Test Facility at IPR  
SUNIL BELSARE, KEDAR BHOPE, MAYUR MEHTA, SAMIR KHIRWADKAR, TUSHAR PATEL,  
RAJAMANNAR SWAMY, SRIKANTA SAHU, PRAKASH MOKARIYA, NIKUNJ PATEL  
IPR/TR-783/2023 (January 2024)

Sensitivity Analysis of Tritium Modelling on LLCB TBM  
PRIYANKA BRAHMBHATT, AMIT SIRCAR  
IPR/TR-784/2023 (January 2024)

Development of 20kV, 50mA High Voltage DC Power Supply for the Plasma Gun experiments  
BHAVESH KADIA, KIRIT PARMAR, RAVI RANJAN, YASHASHRI PATIL, SHANTANU KARAKARI,  
SUNIL KUMAR and HIGH POWER ICRH SYSTEMS DIVISION  
IPR/TR-785/2023 (January 2024)

Disruption Prediction on Aditya/Aditya-U Using Future Sequence Based Time Series Neural Network  
RAMESH JOSHI, J GHOSH, NILESH KALANI, R. L. TANNA, SUNIL KUMAR, M. BHANDARKAR, K.  
A. JADEJA, K. M. PATEL, ROHIT KUMAR, SUMAN AICH, SUMAN DOLUI and M. B. CHOWDHURI  
IPR/TR-786/2023 (January 2024)

Electromagnetic design and analysis of 3T HTS magnet  
DEVENKUMAR KANABAR, UPENDRA PRASAD, PIYUSH RAJ, MAHESH GHATE, SWATI ROY,  
VIPUL TANNA  
IPR/TR-787/2023 (January 2024)

Design, Development and Testing of IF section for FMCW Reflectometry Diagnostics for Tokamaks  
VISHNU CHAUDHARI, JJU BUCH, ROHIT MATHUR, and S.K. PATHAK  
IPR/TR-788/2023 (January 2024)

Overhauling of 1700kVA Diesel Engine and Upgradation of the Controller

G. K. RAJAN, C. K. GUPTA, CHIRAG B. BHAVSAR, PRAKASH K. PARMAR and SUPRIYA A. NAIR  
IPR/TR-789/2023 (February 2024)

On-the-fly Training Architecture for Time Series Neural Network on ADITYA/ADITYA-U Data

RAMESH JOSHI, JOYDEEP GHOSH, NILESHKALANI, SUNIL KUMAR and R. L. TANNA  
IPR/TR-790/2023 (February 2024)

Design and Development of Electronics for Magneto Optic Current Sensor (MOCS) diagnostic in Aditya–  
Upgrade Tokamak

SURESH I., SANTOSH P. PANDYA, PRAVEENLAL E. V, KUMUDNI ASSUDANI, SURYA KUMAR  
PATHAK  
IPR/TR-791/2023 (February 2024)

Design of Metal foil Bolometer Electronics

SURESH I., PRAVEENLAL EV., DEVILAL KUMAWAT, KUMUDNI TAHILIANI, S.K.PATHAK  
IPR/TR-792/2023 (February 2024)

Design Basis Report of Pb-Li Loop

A. PATEL, S. VERMA, A. SARASWAT, P. SATYAMURTHY, S. MALHOTRA, R. BHATTACHARYAY,  
S. GUPTA, A. PRAJAPATI, A. DEOGHAR, D. SHARMA, M. KUMAR, T. S. RAO, A. MAKWANA, A.  
JAISWAL, D. MOHANTA, S. K. SHARMA, V. VASAVA, H. TAILOR, S. SAHU, C. DODIYA, U.  
PRASAD, A. RANJAN and S. RANJITH KUMAR  
IPR/TR-793/2023 (February 2024)

Design and Test of Multi-Channel FPGA based Signal Conditioning Electronics for Thermocouples for Large  
sized Neutral Beam Sources

HIMANSHU TYAGI, HIREN MISTRI, MAINAK BANDYOPADHYAY and ARUN CHAKRABORTY  
IPR/TR-794/2023 (March 2024)

Sequential Control of Vacuum Pumping System for Helicon Plasma Thruster Experiments

PRASHANT KUMAR, RITESH SUGANDHI, KALPESH DOSHI, BUDDU RAMESH KUMAR,  
NARENDER SINGH, PRABAL CHATTOPADHYAY  
IPR/TR-795/2023 (March 2024)

The Realization of Beamline Components and First Ion Beam Neutralization Experimental Results in ROBIN

K. PANDYA, M.J. SINGH, R.K. YADAV, V. MAHESH, R. PANDEY, H.MISTRI, B. PRAJAPATI, M.  
BHUYAN, S. DASH, J. BHAGORA, A. GAHLAUT, M. BANDYOPADHYAY, V. PRAJAPATI, and A.  
CHAKRABORTY  
IPR/TR-796/2023 (March 2024)

Enhancement and Comprehensive Testing of Interlock Protection Systems of High Heat Flux Test Facility at  
IPR

SUNIL BELSARE, TUSHAR PATEL, KEDAR BHOPE, MAYUR MEHTA, SAMIR KHIRWADKAR,  
RAJAMANNAR SWAMY, PRAKASH MOKARIYA, NIKUNJ PATEL  
IPR/TR-797/2023 (March 2024)