

## RESEARCH REPORTS (RR) 2023-24

PRELIMINARY ENGINEERING DESIGN OF VACUUM THERMAL SHIELDED Pb-Li LOOP SECTION FOR POTENTIAL NUCLEAR FUSION APPLICATION

P. A. RAYJADA, V. MEHTA, P. BAWANKAR, S. RANJITH KUMAR, A. PATEL and R. BHATTACHARYAY

IPR/RR-1511/2023 APRIL 2023

STRUCTURAL CHARACTERIZATION OF DUAL LAYER FORMED AFTER PLASMA NITROCARBURIZING OF AISI 304L

JEET VIJAY SAH, ALPHONSA JOSEPH, GHANSHYAM JHALA and SUBROTO MUKHERJEE

IPR/RR-1512/2023 APRIL 2023

ENHANCEMENT OF SHELF LIFE OF CITRUS LIMON L. (LEMON) USING PLASMA ACTIVATED WATER

VIKAS RATHORE and SUDHIR KUMAR NEMA

IPR/RR-1513/2023 APRIL 2023

DIGITAL VIDEO COMMUNICATION USING SALT WATER STANDING COLUMNS

A. SARADA SREE, HITESH CHUDASMA, RAJAN BABU and RAJESH KUMAR

IPR/RR-1514/2023 APRIL 2023

A CASE STUDY OF THERMAL MIXING BEHAVIOR OF HOT AND COLD FLUID IN T-JUNCTION WITH/WITHOUT MIXING JETS

SANDEEP RIMZA, PARITOSH CHAUDHURI, BRIJESH KUMAR YADAV and SAYANTAN MUKHERJEE

IPR/RR-1515/2023 APRIL 2023

STOPBAND AND PASSBAND ANALYSIS OF FREQUENCY SELECTIVE SURFACE NOTCH FILTER FOR PLASMA DIAGNOSTIC APPLICATION

JAINAM BELANI, ABHISHEK SINHA, SURYA K PATHAK

IPR/RR-1516/2023 APRIL 2023

LABEL-FREE DETECTION OF ORAL CAVITY CANCER BY MULTIVARIATE ANALYSIS OF SERS SPECTRA OF SALIVA

SEBIN AUGUSTINE, ARTI HOLE, SOORAJ K. P., MAHESH SAINI, PANKAJ CHATURVEDI, MUKESH RANJAN and C. MURALI KRISHNA

IPR/RR-1517/2023 APRIL 2023

SPATIO-TEMPORAL DYNAMICS OF ANISOTROPIC EMISSION FROM NANO SECOND LASER PRODUCED ALUMINIUM PLASMA

GEETHIKA B R, JINTO THOMAS, MILAAN PATEL, RENJITH KUMAR and HEM CHANDRA JOSHI

IPR/RR-1518/2023 APRIL 2023

STUDY OF RADIATION POWER DYNAMICS IN GAS PUFF DISCHARGES IN ADITYA-U TOKAMAK KUMUDNI TAHILIANI, SURYA KUMAR PATHAK, DEVILAL KUMAWAT, I. SURESH, SAMEER KUMAR, RAJU DANIEL, PRAVEENA KUMARI, MALAY BIKAS CHOWDHURI, UMESH NAGORA, KUMARPAL JADEJA, ROHIT KUMAR, R. K. TANNA, JOYDEEP GHOSH and ADITYA-U TEAM

IPR/RR-1519/2023 APRIL 2023

DEVELOPMENT AND DEMONSTRATION OF THRUST BALANCE OF 300 mN THRUST USING STRAIN GAUGE

NARENDER SINGH, RAMESH KUMAR BUDDU, PRAMILA, P.K. SRIVASTAVA, RENU BAHL, MARIAMMAL M., MRITUNJAY KUMAR and P. K. CHATTOPADHYAY

IPR/RR-1520/2023 APRIL 2023

ANALYTICAL DESIGN OF HIGH-PRESSURE RATIO TURBOEXPANDER IMPELLER AND NOZZLE FOR HELIUM LIQUEFACTION PLANT

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IPR/RR-1521/2023 MAY 2023

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M. KUMAR, RAMESH KUMAR BUDDU, NARENDER SINGH, RENU BAHL and P.K.CHATTOPADHYAY  
IPR/RR-1522/2023 MAY 2023

PHOTOCATALYTIC DYE DEGRADATION USING BALL MILLED ZnO AS CATALYST

RAJASHREE SAHOO, PARITOSH CHAUDHURI and HEM CHANDRA JOSHI  
IPR/RR-1523/2023 MAY 2023

ESTIMATION OF RADIAL PROFILE OF PARTICLE FLUX FROM  $H_{\alpha}$  EMISSIVITY PROFILE IN ADITYA TOKAMAK

RITU DEY, JOYDEEP GHOSH, M. B. CHOWDHURI, TANMAY M. MACWAN, P. K. ATREY, R. MANCHANDA, N. YADAVA and R. L. TANNA  
IPR/RR-1524/2023 MAY 2023

DESIGN AND DEVELOPMENT OF INTERMEDIATE FREQUENCY CIRCUIT FOR REFLECTOMETRY DIAGNOSTIC

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SHIELDED IONISATION DISCHARGE (SID) PROBE FOR SPATIO-TEMPORAL PROFILING OF PULSED MOLECULAR BEAM

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HIGH TEMPERATURE VACUUM BRAZING OF TUNGSTEN TO TUNGSTEN ALLOY WITH STRUCTURAL MATERIAL

K. P SINGH, ALPESH PATEL, KEDAR BHOPE, SANDEEP RIMZA, MAYUR MEHTA, S.S KHIRWADKAR  
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DISCHARGE CHARACTERISTICS OF A LOW-PRESSURE GEOMETRICALLY ASYMMETRIC CYLINDRICAL CAPACITIVELY COUPLED PLASMA WITH AN AXISYMMETRIC MAGNETIC FIELD

SWATI DAHIYA, PAWANDEEP SINGH, NISHANT SIRSE, SARVESHWAR SHARMA, YASHASHRI PATIL and SHANTANU KUMAR KARKARI  
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INVESTIGATION OF EDF EVOLUTION AND CHARGED PARTICLE TRANSPORT IN EXB PLASMA BASED NEGATIVE ION SOURCES USING KINETIC SIMULATIONS

MIRAL SHAH, BHASKAR CHAUDHURY and MAINAK BANDYOPADHYAY  
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PERTURBED PLANE COUETTE FLOW IN THREE-DIMENSIONAL STABLY STRATIFIED YUKAWA LIQUIDS

SURUJ KALITA and RAJARAMAN GANESH  
IPR/RR-1530/2023 MAY 2023

THEORY OF PLASMA BLOB FORMATION AND ITS NUMERICAL AND EXPERIMENTAL VALIDATIONS

N. BISAI and A. SEN  
IPR/RR-1531/2023 MAY 2023

BENCHMARKING OF MINIMUM COLUMN VOLUME DESIGN METHOD FOR RECOVERY OF  $^{99}\text{Mo}$   
FROM LEU URANY SULPHATE SOLUTION  
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IPR/RR-1532/2023 JUNE 2023

ROLE OF TRANSLATIONAL NOISE ON CURRENT REVERSALS OF ACTIVE PARTICLES ON  
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ELECTRON TEMPERATURE GRADIENT (ETG) TURBULENCE: A REALIZATION IN LABORATORY  
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ANALYSIS OF MICROWAVE REFLECTOMETRY DATA USING EMPIRICAL MODE  
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PHOTOREFRACTIVE PROPERTIES OF  $\text{Zn}$  AND  $\text{Fe}$  CO-DOPED  $\text{LiNbO}_3$  SINGLE CRYSTALS  
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IPR/RR-1536/2023 JUNE 2023

A STAGED APPROACH TO INDIAN DEMO  
S.P. DESHPANDE and P.N. MAYA  
IPR/RR-1537/2023 JUNE 2023

MICROSTRUCTURAL AND ANTIBACTERIAL PROPERTIES OF COPPER OXIDE DEPOSITED ON  
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CONCEPTUAL DESIGN OF HELIUM COOLED SOLID BREEDER BLANKET FOR A MODERATE  
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THERMAL EXPANSION STUDIES OF  $\text{Li}_2\text{TiO}_3$  BY DILATOMETRY AND IN-SITU  
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IPR/RR-1543/2023 JULY 2023

PINI ION SOURCE BACK PLATE AND ITS HIGH HEAT FLUX EXPERIMENT

M. R. JANA, TAPAN M. PATEL, U. K. BARUAH, S. M. BELSARE, K. S. BHOPE, B. CHOKSI, N. S. CONTRACTOR, S. S. KHIRWADKAR, M. MEHTA, P. K. MOKARIA, N. P. PATEL, T.H. PATEL, R. SWAMY AND S. TRIPATHI  
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SOLAR PHOTOCATALYTIC DYE DEGRADATION USING ZINC ORTHOTITANATE AS A PHOTOCATALYST

CHINTAN BHALERAU, RAJASHREE SAHOO, AROH SHRIVASTAVA, PARITOSH CHAUDHURI, T.S. RAJARAMAN  
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SPECTROSCOPIC & MICROSCOPIC STUDIES ON INACTIVATION OF STAPHYLOCOCCUS AUREUS AND SALMONELLA ABONY EXPOSED TO DIRECT CURRENT PLASMA

TEJAL BARKHADE, KUSHAGRA NIGAM, G.RAVI, SEEMA RAWAT and S.K NEMA  
IPR/RR-1546/2023 JULY 2023

WIDEBAND RECONFIGURABLE PLASMA ANTENNA LAUNCHED BY SURFACE WAVE COUPLER  
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IPR/RR-1547/2023 JULY 2023

EXPERIMENTAL INVESTIGATION OF A TRIPLE POINT IN A DUSTY PLASMA

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IPR/RR-1548/2023 JULY 2023

PSEUDO-SPECTRAL SOLVER VERSUS GRID-BASED SOLVER: A QUANTITATIVE ACCURACY TEST USING *GMHD3D* AND *PLUTO4.4*

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DEVELOPMENT OF SUPERHYDROPHOBIC PTFE SURFACE USING OXYGEN PLASMA PROCESSING

SHRUTI KUMARI, VIVEK PACHCHIGAR, BASANTA KUMAR PARIDA, SUKRITI HANS, MAHESH SAINI, SOORAJ K. P. , ROYAL CHRISTIAN, and MUKESH RANJAN  
IPR/RR-1550/2023 AUGUST 2023

DIRECT MEASUREMENT OF MAGNETIC FIELD WITH LOW DRIFT ERROR USING AN ACTIVE INTEGRATOR FOR ADITYA-U DISCHARGES

SAMEER KUMAR, KUMUDNI ASSUDANI, PRAVEENA KUMARI, SURESH I, SURYA KUMAR PATHAK, RACHNA RAJPAL, ADITYA-U TEAM  
IPR/RR-1551/2023 AUGUST 2023

DEVELOPMENT OF LEAD LITHIUM (Pb-16Li) ALLOY PRODUCTION SYSTEM AND CHARACTERIZATION OF THE PRODUCED ALLOY

A. DEOGHAR, A. PRAJAPATI, S. VERMA, A. SARASWAT, S. GUPTA, D. SHARMA, N. KUMAR, C. SASMAL, V. VASAVA, H. TAILOR, R. BHATTACHARYAY  
IPR/RR-1552/2023 AUGUST 2023

AN APPARATUS TO MEASURE THERMAL CONDUCTIVITY OF CERAMIC PEBBLE BEDS UNDER UNIAXIAL COMPRESSIVE STRESS  
HARSH PATEL, MAULIK PANCHAL, PARITOSH CHAUDHURI  
IPR/RR-1553/2023 AUGUST 2023

DE-NOISING OF MICROWAVE REFLECTOMETRY SIGNAL USING MAXIMAL OVERLAP DISCRETE WAVELET PACKET TRANSFORM FOR PLASMA DENSITY MEASUREMENT  
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POSITION ESTIMATION OF CURRENT-CARRYING FILAMENT USING DIFFERENT MAGNETIC SENSORS IN ADITYA-U TOKAMAK  
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IPR/RR-1555/2023 AUGUST 2023

MANUFACTURING OF HIGH PURITY  $\text{Cr}_2\text{AlC}$  MAX PHASE MATERIAL: SYNTHESIS AND CHARACTERISATION  
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IPR/RR-1556/2023 AUGUST 2023

KINETIC INSTABILITY OF WHISTLERS IN ELECTRON BEAM-PLASMA SYSTEMS  
ANJAN PAUL, and DEVENDRA SHARMA  
IPR/RR-1557/2023 AUGUST 2023

MECHANICAL AND ELECTRICAL PERFORMANCE OF GLASS FIBER REINFORCED PLASTICS INSULATION FOR CRYOGENIC APPLICATION IN FUSION MAGNET IRRADIATED IN FAST BREEDER REACTOR  
RAJIV SHARMA, V. L. TANNA, MITUL ABHANGI, H.L. SWAMI, E. RADHA, G. RAGHU KUMAR, KV SURESH and ALKESH M MAVANI  
IPR/RR-1558/2023 AUGUST 2023

HIGH MHD ACTIVITY INDUCED EXCITATION OF GAM-LIKE MODE IN ADITYA-U TOKAMAK  
KAUSHLENDER SINGH, SUMAN DOLUI, BHARAT HEGDE, ASHOK K. KUMAWAT, ANKIT KUMAR, TANMAY MACWAN, HARSHITA RAJ, SHARVIL PATEL, NANDINI YADAVA, ABHA KANIK, KAJAL SHAH, PRAMILA GAUTAM, ROHIT KUMAR, SUMAN AICH, LAXMIKANTA PRADHAN, ANKIT PATEL, KALPESH GALODIYA, DANIEL RAJU, S.K. JHA, K. A. JADEJA, K. M. PATEL, S. N. PANDYA, LAVKESH LACHHVANI, M.B. CHAUDHARY, R.L. TANNA, P. K. CHATTOPADHYAY, R. PAL, Y. C. SAXENA, ABHIJIT SEN, and JOYDEEP GHOSH  
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INVESTIGATION OF FACET EVOLUTION ON  $\text{Si}$  SURFACES BOMBARDED WITH  $\text{Xe}$  IONS  
SUKRITI HANS, BASANTA KUMAR PARIDA, SEBIN AUGUSTINE, VIVEK PACHCHIGAR, SOORAJ K P, MUKESH RANJAN  
IPR/RR-1560/2023 AUGUST 2023

EXPERIMENTAL VALIDATION OF THE ANALYTIC MODEL FOR THE TEMPORAL DECAY OF THE DENSITY AUTO-CORRELATION FUNCTION IN A STRONGLY COUPLED DUSTY PLASMA  
ANKIT DHAKA, PINTU BANDYOPADHYAY, PV SUBHASH, and A. SEN  
IPR/RR-1561/2023 AUGUST 2023

STABILIZATION OF SAWTEETH INSTABILITY BY SHORT GAS PULSE INJECTION IN ADITYA-U TOKAMAK

SUMAN DOLUI, KAUSHLINDER SINGH, TANMAY MACWAN, HARSHITA RAJ, BHARAT HEGDE, PRAVESH DHYANI, ANKIT KUMAR, ASHOK KUMAWAT, K.A JADEJA, J GHOSH, R L TANNA, SUMAN AICH, ROHIT KUMAR, K M PATEL, P. GAUTAM, L. PRADHAN, SHARVIL PATEL, YM NANDINI, A. PATEL, UMESH NAGORA, M.K. GUPTA, M.B. CHOWDHURY, S. PUROHIT, A.N. ADHIYA

IPR/RR-1562/2023 SEPTEMBER 2023

ADVANCEMENT OF LANGMUIR PROBE-BASED LASER PHOTO DETACHMENT TECHNIQUE FOR NEGATIVE ION DENSITY MEASUREMENT IN A HIGH POWER HELICON PLASMA SOURCE

D. MUKHOPADHYAY, M. BANDYOPADHYAY, H. TYAGI, K. PATEL

IPR/RR-1563/2023 SEPTEMBER 2023

EXPERIMENTAL DETERMINATION OF HYDROGEN ISOTOPE DIFFUSIVITY, SOLUBILITY AND PERMEABILITY IN MOLTEN LEAD LITHIUM EUTECTIC ALLOY

SUDHIR RAI, AMIT SIRCAR and R. BHATTACHARYAY

IPR/RR-1564/2023 SEPTEMBER 2023

SYSTEMATIC STUDY OF ELECTRIC FIELD REVERSAL PHENOMENON IN LOW PRESSURE CAPACITIVE DISCHARGES EXCITED BY SAWTOOTH-LIKE WAVEFORM

SARVESHWAR SHARMA, NISHANT SIRSE and ANIMESH KULEY

IPR/RR-1565/2023 SEPTEMBER 2023

EXCITATION OF CYLINDRICAL AND SPHERICAL PRECURSOR SOLITONS IN A FLOWING DUSTY PLASMA: EXPERIMENTAL AND SIMULATION STUDIES

KRISHAN KUMAR, P. BANDYOPADHYAY, SWARNIMA SINGH, and A. SEN

IPR/RR-1566/2023 SEPTEMBER 2023

EFFECT OF THERMAL ELECTRONS INSIDE THE SHEATHS ON THE RESONANCE FREQUENCY OF A DC-BIASED HAIRPIN PROBE

PAWANDEEP SINGH, AVNISH PANDEY, SWATI DAHIYA, YASHASHRI PATIL, NISHANT SIRSE, SHANTANU KARKARI

IPR/RR-1567/2023 SEPTEMBER 2023

FEASIBILITY STUDY OF HTS CURRENT LEADS WITH  $MgB_2$  SHUNT FOR TOKAMAK APPLICATION

NITIN BAIRAGI, VIPUL L. TANNA, HIREN NIMAVAT, DASHRATH SONARA, ATUL GARG, ROHITKUMAR PANCHAL, GAURANG MAHESURIA, RAKESHKUMAR PATEL, DIKENS CHRISTIAN, GAURAV PURWAR, PRADIP PANCHAL, UPENDRA PRASAD, and DANIEL RAJU

IPR/RR-1568/2023 SEPTEMBER 2023

EXPERIMENTAL MEASUREMENT OF SHEATH EDGE ELECTRIC FIELD USING A MICROWAVE HAIRPIN RESONATOR PROBE

PAWANDEEP SINGH, AVNISH PANDEY, SWATI DAHIYA, SHANTANU KARKARI

IPR/RR-1569/2023 OCTOBER 2023

INVESTIGATION OF DEVELOPED LIQUID STUB TUNER FOR THE ANTENNA IMPEDANCE MATCHING FOR HIGH POWER RF PLASMA EXPERIMENTS

RAJ SINGH, VARUN, VISHANT GAHLAUT, JOYDEEP GHOSH, PRABHAKAR TRIPATHI, HANSRAJ KACHHAWA, UTTAM GOSWAMI, and V. P. ANITHA

IPR/RR-1570/2023 OCTOBER 2023

REMOTE HANDLING CONTROL SYSTEM AND OPERATIONS OF VACUUM COMPATIBLE IN-  
VESSEL INSPECTION SYSTEM

NAVEEN RASTOGI, MANOAH STEPHEN, KRISHAN KUMAR GOTEWAL, RAVI RANJAN KUMAR,  
JIGNESH CHAUHAN, PRAMIT DUTTA, DILIP RAVAL, YUVAKIRAN P, SIJU GEORGE

IPR/RR-1571/2023 OCTOBER 2023

FABRICATION OF Al<sub>6061</sub>/Ti<sub>3</sub>AlC<sub>2</sub> MAX PHASE SURFACE COMPOSITE BY FRICTION STIR  
PROCESSING AND INVESTIGATION OF WEAR PROPERTIES

VYOM DESAI, VISHVESH BADHEKA, ARUNSINH ZALA, TEJAS PAREKH, N. I. JAMNAPARA

IPR/RR-1572/2023 OCTOBER 2023

DEVELOPMENT OF LAB-SCALE ATMOSPHERIC MOLECULAR SIEVE BED AND GENERATION OF  
EXPERIMENTAL BREAK THROUGH CURVES FOR ADSORPTION STUDIES

DEEPAK YADAV, V. GAYATHRI DEVI, PRAGNESH DHORAJIYA, AMIT MUNIA, AMIT SIRCAR, R.  
BHATTACHARYAY

IPR/RR-1573/2023 OCTOBER 2023

DEVELOPMENT AND PERFORMANCE EVALUATION OF Sr<sub>2</sub>CeO<sub>4</sub> - SrCe<sub>0.85</sub>Y<sub>0.15</sub>O<sub>3- $\delta$</sub>  BASED  
ELECTROCHEMICAL HYDROGEN ISOTOPES SENSOR

DEEPAK YADAV, AROH SHRIVASTAVA, AMIT SIRCAR, PRAGNESH DHORAJIYA, AMIT MUNIYA  
and RAJENDRA PRASAD BHATTACHARYAY

IPR/RR-1574/2023 OCTOBER 2023

ION TEMPERATURE DYNAMICS FOR THE EDGE AND SCRAPE-OFF LAYER PLASMA  
TURBULENCE: ROLE OF GYRO-VISCOSITY AND VORTICITY

N BISAI

IPR/RR-1575/2023 OCTOBER 2023

DESIGN AND ANALYSIS OF MIXED BED SOLID BREEDER BLANKET WITH TITANIUM  
BERRYLIDE AS NEUTRON MULTIPLIER

DEEPAK SHARMA, PARITOSH CHAUDHURI, H.L SWAMI, MITUL R ABHANGI, S.  
BHATTACHARYA

IPR/RR-1576/2023 OCTOBER 2023

INVESTIGATION OF THERMAL HYDRAULICS PERFORMANCE OF Pb-Li IN A SQUARE DUCT

SRIKANTA SAHU, ASHOK PRAJAPATI, DUSMANTA MOHANTA, KARISHMA PANDYA, SANDEEP  
GUPTA and RAJENDRAPRASAD BHATTACHARYAY

IPR/RR-1577/2023 OCTOBER 2023

DECONFINEMENT OF RUNAWAY ELECTRONS BY LOCAL VERTICAL MAGNETIC FIELD  
PERTURBATION

SOMESWAR DUTTA, DEEPTI SHARMA, R. L. TANNA, J. GHOSH, LT. R. SRINIVASAN and D. RAJU

IPR/RR-1578/2023 NOVEMBER 2023

MEASUREMENT OF COOLING POWER OF HELIUM REFRIGERATOR-CUM-LIQUEFIER PLANT  
DEVELOPED AT IPR

A. K. SAHU, O. CHANDRATRE, V. PATEL, P. SINGH, H. DAVE, H. KAVAD, R. BHATASANA, N.  
KUMAR, P. BRAHMBHATT

IPR/RR-1579/2023 NOVEMBER 2023

PRACTICAL PEDAGOGICAL APPROACHES IN HPC FOR OPTIMIZING COMPLEX PROGRAMMING  
ALGORITHMS: A NUCLEAR FUSION APPLICATION CASE STUDY

SOMESWAR DUTTA, DEEPAK AGGARWAL, DANIEL RAJU

IPR/RR-1580/2023 NOVEMBER 2023

TAILORED PEROVSKITE OXIDE ENGINEERED WITH MULTI-DIMENSIONAL CARBON TO SIMULTANEOUSLY IMPROVE THE ACTIVITY AND STABILITY TOWARDS OXYGEN EVOLUTION REACTION

AMIT K. RANA, AMREEN A. HUSSAIN, SURYAKANT B. GUPTA

IPR/RR-1581/2023 NOVEMBER 2023

ENHANCING HEAT TRANSFER AND ENTROPY GENERATION MINIMIZATION WITH MONO AND HYBRID NANOFLUIDS: AN EXPERIMENTAL STUDY

SAYANTAN MUKHERJEE, SHIKHA EBRAHIM, PURNA CHANDRA MISHRA, PARITOSH CHAUDHURI

IPR/RR-1582/2023 NOVEMBER 2023

PATTERN RECONFIGURABILITY USING PLASMA FOR BEAMSTEERING APPLICATION AT S-BAND

MANISHA JHA, NISHA PANGHAL, RAJESH KUMAR, SURYA K PATHAK

IPR/RR-1583/2023 NOVEMBER 2023

A NOVEL DESIGN OF OHMIC TRANSFORMER POWER SUPPLY (OTPS) FOR SPHERICAL TOKAMAKS

AYUSH, URMIL THAKER, AND SUPRIYA NAIR

IPR/RR-1584/2023 NOVEMBER 2023

A STUDY ON CYCLIC LOADING ANALYSIS OF CERAMIC BREEDER PEBBLE BED FOR FUSION BLANKET

CHIRAG SEDANI, HARSH PATEL, MAULIK PANCHAL, PARITOSH CHAUDHURI

IPR/RR-1585/2023 NOVEMBER 2023

EFFECT OF ELECTRON AND ION MOBILITY ON EDGE BIASING IN TOKAMAK PLASMAS

VIJAY SHANKAR, N. BISAI, SHRISH RAJ, and A. SEN

IPR/RR-1586/2023 NOVEMBER 2023

NEUTRON EMISSION CHARACTERIZATION OF IPR 14 MeV NEUTRON GENERATOR

M. ABHANGI, S. VALA, H. L. SWAMI, RATNESH KUMAR, A. SAXENA AND RAJESH KUMAR

IPR/RR-1587/2023 NOVEMBER 2023

OPTIMIZING THERMO-PHYSICAL PROPERTIES OF  $Al_2O_3$  and  $TiO_2$  NANOFLUIDS: A TAGUCHI - RESPONSE SURFACE METHODOLOGY APPROACH

SAYANTAN MUKHERJEE, AGUS NUGROHO, PURNA CHANDRA MISHRA, PARITOSH CHAUDHURI, MUHAMMAD KOZIN

IPR/RR-1588/2023 DECEMBER 2023

IN-VESSEL INSPECTION SYSTEM: DEVELOPMENT AND TESTING ACTIVITIES OF HIGH VACUUM AND TEMPERATURE TECHNOLOGIES FOR FUSION REMOTE HANDLING

MANOAHSTEPHEN M, NAVEEN RASTOGI, RAVI RANJAN KUMAR, KRISHAN KUMAR GOTEWAL, JIGNESH CHAUHAN, YUVAKIRAN PARAVASTU, DILIP RAVAL, SIJU GEROGI

IPR/RR-1589/2023 DECEMBER 2023

CHARGED PARTICLE DYNAMICS IN AN ELLIPTICALLY POLARIZED ELECTROMAGNETIC WAVE AND A UNIFORM AXIAL MAGNETIC FIELD

SHIVAM KUMAR MISHRA, SARVESHWAR SHARMA, and SUDIP SENGUPTA

IPR/RR-1590/2023 DECEMBER 2023

A COMPREHENSIVE REVIEW OF EXPERIMENTAL AND NUMERICAL STUDIES ON LIQUID METAL-GAS TWO-PHASE FLOWS AND ASSOCIATED MEASUREMENT CHALLENGES

ABHISHEK SARASWAT, ALBERTO FRAILE, SATEESH GEDUPUDI, RAJENDRAPRASAD BHATTACHARYAY and PARITOSH CHAUDHURI

IPR/RR-1591/2023 DECEMBER 2023



FIRST OPERATION OF LLMHD LOOP WITH ELECTROMAGNET FOR R & D MHD EXPERIMENTS  
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, C. DODIYA, U.  
PRASAD, A. RANJAN and S. RANJITH KUMAR

IPR/RR-1592/2023 DECEMBER 2023

TURBULENT SPOT FORMATION IN THREE-DIMENSIONAL YUKAWA LIQUIDS USING LARGE-  
SCALE MOLECULAR DYNAMICS SIMULATION - EFFECT OF SYSTEM SIZE

SURUJ KALITA and RAJARAMAN GANESH

IPR/RR-1593/2023 DECEMBER 2023

FRICTION WELDING OF ETP Cu PLATE TO SS304L ROUND BAR: AN EXPERIMENTAL STUDY ON  
ASYMMETRICAL DISSIMILAR METAL JOINTS

TAPAN PATEL, HARDIK D. VYAS, M. R. JANA, P. CHAUDHURI, U. K. BARUAH

IPR/RR-1594/2023 DECEMBER 2023

MEASUREMENTS OF EFFECTIVE THERMAL CONDUCTIVITY OF LITHIUM METATITANATE  
PEBBLE BEDS USING TRANSIENT HOT WIRE TECHNIQUE UNDER UNIAXIAL COMPRESSION

MAULIK PANCHAL, HARSH PATEL, PARITOSH CHAUDHURI

IPR/RR-1595/2023 DECEMBER 2023

NUMERICAL DESIGN AND EXPERIMENTAL CHARACTERIZATION OF RECONFIGURABLE LEAKY  
WAVE PLASMA ANTENNA

R. R. HIRANI, A. SINHA, A. K. PANDEY, S. K. PATHAK, S. N. SHAH

IPR/RR-1596/2024 JANUARY 2024

COMPUTATIONAL FLUID DYNAMICS MODELLING AND VALIDATION OF ROTATING  
DETONATION ENGINE

SUNIL BASSI, KALUKURTHY TONY SANDEEP, AND VENKATA RAMANA IKKURTHI

IPR/RR-1597/2024 JANUARY 2024

IMPACT OF TOROIDAL FIELD GENERATED ERROR FIELD OVER ADITYA OHMIC START-UP

S. PUROHIT, J. GHOSH, M.K. GUPTA, K. A. JADEJA, M.B. CHOWDHURI, R. MANCHANDA, K.  
PATEL, S.B. BHATT, M. MAKWANA, C.N. GUPTA, S.K. PATHAK, R.L. TANNA, Y.C. SAXENA, and  
ADITYA TEAM

IPR/RR-1598/2024 JANUARY 2024

OVERVIEW OF PHYSICS RESULTS FROM THE ADITYA-U TOKAMAK AND FUTURE  
EXPERIMENTS

R.L. TANNA, J. GHOSH, K.A. JADEJA, ROHIT KUMAR, SUMAN AICH, K.M. PATEL, HARSHITA RAJ,  
KAUSHLINDER SINGH, SUMAN DOLUI, KAJAL SHAH, S. PATEL, NANDINI YADAVA, TANMAY  
MACWAN, A. KANIK, ANKIT KUMAR, BHARAT HEGDE, ASHOK KUMAWAT, A. KUNDU, R. JOSHI,  
DEEPTI SHARMA, ANKIT PATEL, L. PRADHAN, K. GALODIYA, SHWETANG PANDYA, SOUMITRA  
BANERJEE, SK INJAMUL HOQUE, KOMAL, M.B. CHOWDHURI, R. MANCHANDA, N. RAMAIYA,  
RITU DEY, G. SHUKLA, D. MODI, VISHAL SHARMA, AMAN GAUTTAM, M.N. MAKWANA, KUNAL  
SHAH, S. GUPTA, SUPRIYA NAIR, S. PUROHIT, U.C. NAGORA, A. ADHIYA, KIRAN PATEL,  
KUMUDNI ASUDANI, S.K. JHA, D. KUMAWAT, SANTOSH PANDYA, VARSHA S., PRAVEENLAL  
EDAPPALA, B. ARAMBHADIYA, MINSHA SHAH, PRAMILA GAUTAM, V. RAULJI, PRAVEENA  
SHUKLA, ABHIJEET KUMAR, MITESH PATEL, R. RAJPAL, M. BHANDARKAR, IMRAN MANSURI,  
KIRTI MAHAJAN, K. MISHRA, SUNIL KUMAR, B.K. SHUKLA, JAGABANDHU KUMAR, P.K.  
SHARMA, SNEHLATA AGGARWAL, KUMAR AJAY, M.K. GUPTA, S.K. PATHAK, P.K.  
CHATTOPADHYAY, D. RAJU, S. DUTTA, S. PAHARI, N. BISAI, CHETNA CHAUHAN, Y.C. SAXENA,  
A. SEN, R. PAL and S. CHATURVEDI

IPR/RR-1599/2024 JANUARY 2024

STUDY OF MHD INSTABILITIES USING FAST VISIBLE IMAGING DIAGNOSTIC IN ADITYA-U TOKAMAK

DEVILAL KUMAWAT, KUMUDNI TAHILIANI, KAUSHLENDER SINGH, SUMAN DOLUI, SAMEER KUMAR, SURESH I, R.L TANNA, KAUSHAL M PATEL, KUMARPALSINH JADEJA, MANOJ K GUPTA, S.K PATHAK, JOYDEEP GHOSH, and ADITYA-U TEAM  
IPR/RR-1600/2024 JANUARY 2024

INVESTIGATING THE EFFICACY OF PLASMA WASHING FOR STAINS REMOVAL

VIKAS RATHORE and SUDHIR KUMAR NEMA  
IPR/RR-1601/2024 JANUARY 2024

NUMERICAL SIMULATION OF AN EXPANDING MAGNETIC FIELD PLASMA THRUSTER USING IODINE FUEL

VINOD SAINI, RAJARAMAN GANESH  
IPR/RR-1602/2024 JANUARY 2024

AUTOMATED LABELLING AND CORRELATION ANALYSIS OF DIAGNOSTIC SIGNALS FROM ADITYA TOKAMAK FOR DEVELOPING AI BASED DISRUPTION MITIGATION SYSTEMS

J. AGARWAL, B. CHAUDHARY, S. JAKHAR, N. SHAH, S. ARORA, D. SONI, M. SHARMA  
IPR/RR-1603/2024 JANUARY 2024

INFLUENCE OF WALL ON PLASMA TRANSPORT ACROSS MAGNETIC FILTER FIELD IN A NEGATIVE ION SOURCE: A 2D-3V PIC MCC SIMULATION STUDY

MIRAL SHAH, BHASKAR CHAUDHURY, MAINAK BANDYOPADHYAY  
IPR/RR-1604/2024 JANUARY 2024

ON SPIN OF PLASMA BLOB IN EDGE AND SCRAPE-OFF LAYER REGIONS OF A TOKAMAK N BISAI

IPR/RR-1605/2024 FEBRUARY 2024

RADIAL POSITION MEASUREMENT OF PLASMA COLUMN USING SOFT X-RAY DIAGNOSTICS IN ADITYA-U TOKAMAK A. ADHIYA, A. KUMAR, M. K. GUPTA, P. KUMARI, D. K. SAINI, S. K.

GUPTA, M. CHAVDA, S. PUROHIT, K. GARG, R. RAJPAL, S. K. PATHAK, R. KUMAR, S. AICH, H. RAJ, R. TANNA, J. GHOSH, and ADITYA-U TEAM

IPR/RR-1606/2024 FEBRUARY 2024

SIMULATION STUDY OF 4 kV, 5A MODULAR MULTILEVEL CONVERTER AS A RECTIFIER

MEDDI THARUN, ARITRA CHAKRABORTY, ASHOK MANKANI, VIVEK PATEL, KUMAR SAURABH, ADITYA NAUGRAIYA, AMAL S, PAUL D CHRISTAIN, UJJWAL KUMAR BARUAH

IPR/RR-1607/2024 FEBRUARY 2024

CONCEPTUAL DESIGN OF COPPER OXIDE (CuO) METAL BED FOR FUSION FUEL CYCLE

RUDREKSH B. PATEL, RAJENDRA BHATTACHARYAY, PARITOSH CHAUDHURI

IPR/RR-1608/2024 FEBRUARY 2024

OFF-TARGET GRADIENT DRIVEN FLOWS IN 3D SIMULATIONS OF ADITYA-UPGRADE TOKAMAK SCRAPE-OFF-LAYER PLASMA TRANSPORT

ARZOO MALWAL, BIBHU PRASAD SAHOO, DEVENDRA SHARMA, and YUHE FENG

IPR/RR-1609/2024 FEBRUARY 2024

GYROKINETIC SIMULATIONS OF ELECTROSTATIC MICROTURBULENCE IN ADITYA-U TOKAMAK WITH ARGON IMPURITY

TAJINDER SINGH, KAJAL SHAH, DEEPTI SHARMA, JOYDEEP GHOSH, KUMARPALSINH A. JADEJA, RAKESH L. TANNA, ZHIHONG LIN, ABHIJIT SEN, SARVESHWAR SHARMA, ANIMESH KULEY

IPR/RR-1610/2024 FEBRUARY 2024

DESIGN CONSIDERATIONS FOR ACTIVE POSITION MAGNET CONTROL POWER SUPPLY FOR PLASMA VERTICAL POSITION CONTROL IN ADITYA-U TOKAMAK  
ROHIT KUMAR, HARSHITA RAJ, VINAY MENON, DEEPTI SHARMA, DARSHAN PARMAR, DINESH SHARMA, VISHAL JAIN, YSS SRINIVAS, SHIVAM GUPTA, RAKESH TANNA, ASHOK MANKANI and JOYDEEP GHOSH  
IPR/RR-1611/2024 FEBRUARY 2024

TRAPPED ELECTRON COUPLED ITG TURBULENCE SIMULATION FOR ADITYA-U  
AMIT K. SINGH, S. CHOUDHARY, M. GOPAL KRISHNA, J. MAHAPATRA, A. BOKSHI, J. CHOWDHURY, R. GANESH, T. HAYWARD-SCHNEIDER, E. LANTI, A. MISHCHENKO, B. F. MCMILLAN and L. VILLARD  
IPR/RR-1612/2024 FEBRUARY 2024

NUMERICAL SIMULATION OF AN EXPANDING MAGNETIC FIELD PLASMA THRUSTER: A COMPARATIVE STUDY FOR ARGON, XENON AND IODINE FUEL GASES  
VINOD SAINI, RAJARAMAN GANESH  
IPR/RR-1613/2024 FEBRUARY 2024

UBIQUITOUS MODES IN TOKAMAKS  
SAGAR CHOUDHARY, JUGAL CHOWDHURY, M GOPAL KRISHNA, JAGANNATH MAHAPATRA, AMIT K. SINGH, RAJARAMAN GANESH, LAURENT VILLARD  
IPR/RR-1614/2024 FEBRUARY 2024

FRACTIONAL-ORDER MODELLING AND ANALYSIS OF MODULAR MULTILEVEL CONVERTER  
VIVEK PATEL, ASHOK MANKANI, KUMAR SAURABH, ARITRA CHAKRABORTY, ADITYA NAUGRAIYA, MEDDI THARUN, RAJESH KUMAR  
IPR/RR-1615/2024 FEBRUARY 2024

UNDERWATER IN-SITU PLASMA TREATMENT OF COARSE WOOL FIBERS FOR SCOURING AND BLEACHING  
NISHA CHANDWANI, HIMANSHU PANDEY and VISHAL JAIN  
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NUMERICAL VALIDATION OF YUKAWA FLUID EXCITATIONS WITHIN THE QUASILocalized CHARGE APPROXIMATION (QLCA) THEORY  
PRINCE KUMAR, and DEVENDRA SHARMA  
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DESTABILIZATION OF A TOROIDAL ELECTRON PLASMA VORTEX BY IONS VIA IMPACT IONIZATION OF BACKGROUND NEUTRALS  
S. KHAMARU, R. GANESH, and M. SENGUPTA  
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INVESTIGATION OF ELECTROMAGNETIC FLUCTUATION IN MAGNETICALLY SCREENED HIGH BETA PLASMA  
AYAN ADHIKARI, A. K. SANYASI, L. M. AWASTHI, P. K. SRIVASTAVA, MAINAK BANDOPADHYAY, DEVENDRA SHARMA, ANSHU VERMA, and RITESH SUGANDHI  
IPR/RR-1619/2024 FEBRUARY 2024

SYSTEM FOR MICROWAVE PLASMA EXPERIMENTS (SYMPLE) FOR INVESTIGATION OF MICROWAVE ABSORPTION IN OVER-DENSE PLASMA  
PRIYAVANDANA J. RATHOD, ANITHA V P, and D V GIRI  
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PHYSICS AND ENGINEERING CONSIDERATIONS FOR COMPACT FUSION PILOT PLANTS  
P. N. MAYA, P. PRAJAPATI, S.P. DESHPANDE, P.K. SHARMA, M. GHATE, C. DANANI, V. MEHTA,  
H.L. SWAMI, U. PRASAD, and P. CHAUDHURI  
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SELF-INDUCED CONVECTIVE PATTERN FORMATIONS IN DUSTY PLASMA EXPERIMENTS  
ANKIT DHAKA, P. BANDYOPADHYAY, PV SUBHASH, and A. SEN  
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DIAGNOSTIC STUDIES  
GAJENDRA SINGH, A K SINGH, M. B. CHOWDHURI, and T. NANDI  
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DESIGN OF HIGH-FREQUENCY PULSE TUBE CRYOCOOLER FOR SAMPLE TESTING IN CRYO-  
PUMP APPLICATIONS  
SARVESH KASHYAP, ABHINAV B. DESAI, HEMANG S. AGRAVAT, SAMIRAN MUKHERJEE,  
VISHAL GUPTA, JYOTI S. MISHRA, MONI BANAUDHA, PARESH PANCHAL, PRATIK A NAYAK and  
RANJANA GANGRADEY  
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EXPERIMENTAL INVESTIGATION OF AN ELECTRONEGATIVE CYLINDRICAL CAPACITIVELY  
COUPLED GEOMETRICALLY ASYMMETRIC PLASMA DISCHARGE WITH AN AXISYMMETRIC  
MAGNETIC FIELD  
SWATI DAHIYA, NARAYAN SHARMA, SHIVANI GEETE, SARVESHWAR SHARMA, NISHANT  
SIRSE and SHANTANU KARKARI  
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ALUMINIDE COATINGS ON Ni BASED SUPERALLOYS  
ARUNSINH B ZALA, KAUSTUBH SAMVATSAR, VYOM DESAI, VANDANA RAO, ATUL SHARMA,  
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OBSERVER-BASED TIME VARYING LINEAR QUADRATIC CONTROL OF MODULAR MULTILEVEL  
CONVERTER  
VIVEK PATEL, ASHOK MANKANI, KUMAR SAURABH, ARITRA CHAKRABORTY  
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AGGREGATE MORPHING OF SELF-ALIGNING SOFT ACTIVE DISKS IN SEMI-CONFINED  
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ANSHIKA CHUGH, SOUMEN DE KARMAKAR, RAJARAMAN GANESH  
IPR/RR-1628/2024 MARCH 2024

ASSESSING THE PRESERVATION EFFECTIVENESS: A COMPARATIVE ANALYSIS OF PLASMA  
ACTIVATED WATER AND VARIOUS PRESERVATIVES ON CAPSICUM ANNUUM L. (JALAPENO  
AND PUSA JWALA)  
VIKAS RATHORE, PIYUSH SHARMA, ARUN PRASATH VENUGOPAL, and SUDHIR KUMAR NEMA  
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MATCHING PARAMETER ESTIMATION FOR HIGH POWER ICP SOURCES USING MACHINE  
LEARNING TECHNIQUES  
HIMANSHU TYAGI, MV JOSHI, MAINAK BANDYOPADHYAY, MJ SINGH, KAUSHAL PANDYA, and  
ARUN CHAKRABORTY  
IPR/RR-1630/2024 MARCH 2024

DESIGN, FABRICATION AND VALIDATION OF AN ELECTRICAL CONDUCTIVITY PRINCIPLE BASED TWO-PHASE DETECTION SENSOR ARRAY FOR MOLTEN LEAD (Pb) BASED HEAVY METAL COOLANTS UP TO 600°C

A. SARASWAT, R. BHATTACHARYAY, S. GEDUPUDI and P. CHAUDHURI

IPR/RR-1631/2024 MARCH 2024

DEUTERIUM PERMEATION STUDIES THROUGH BARE AND  $\text{Er}_2\text{O}_3$  COATED SS 316L

S. RAI, P. A. RAYJADA, P. B. DHORAJIYA, R. B. PATEL, S. K. SHARMA, A. SIRCAR AND R. BHATTACHARYAY

IPR/RR-1632/2024 MARCH 2024

VISIBLE CAMERA IMAGE INTERPRETATION OF TOKAMAK PLASMA USING DEEP LEARNING METHOD

VISHNU CHAUDHARI, SURAJ GUPTA and MANOJ GUPTA

IPR/RR-1633/2024 MARCH 2024

SUSTAINABLE HEAT TRANSFER: OPTIMAL MIXING RATIO IN  $\text{MgO-SiO}_2$  HYBRID NANOFLUID

SAYANTAN MUKHERJEE, PARITOSH CHAUDHURI, PURNA CHANDRA MISHRA

IPR/RR-1634/2024 MARCH 2024