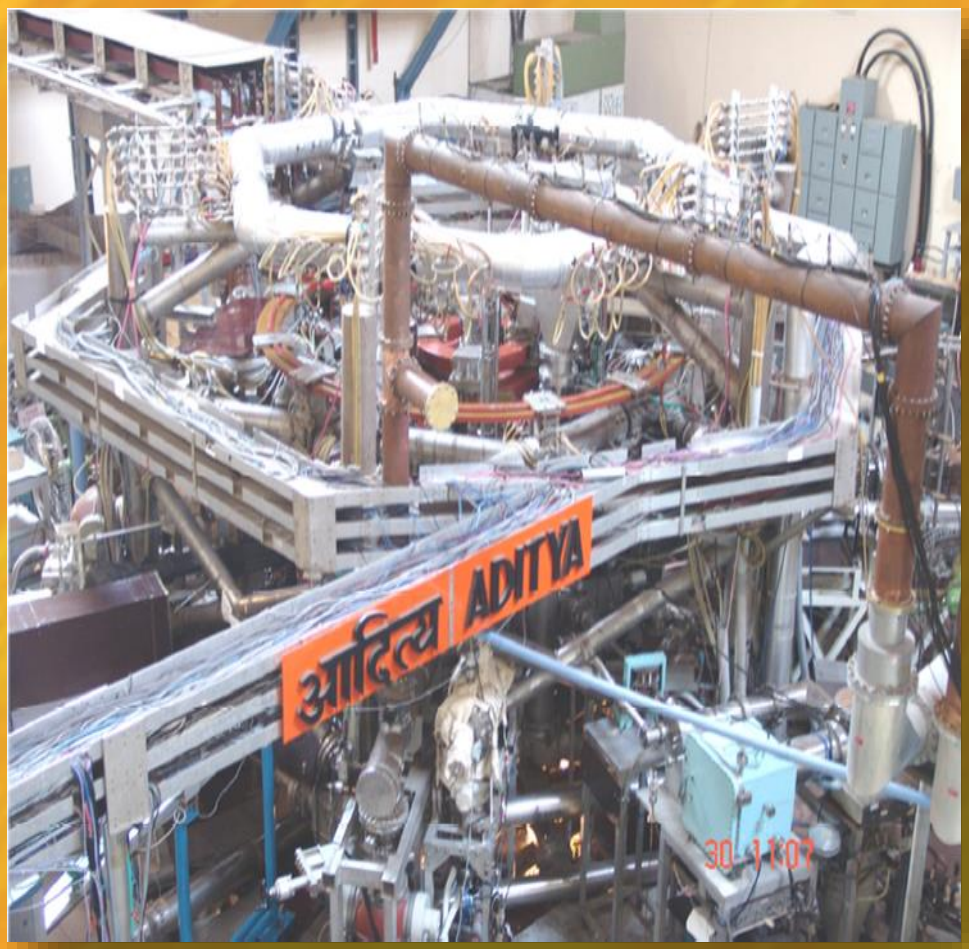
National Symposium for Commemorating 30-years of ADITYA Tokamak



27th and 28th January 2020

Organised by:

Institute for Plasma Research (IPR)
Bhat, Gandhinagar, Gujarat
&
Department of Atomic Energy (DAE)
Mumbai

Venue
Entrepreneurship Development Institute (EDI) of India, Gandhinagar

PFEIFFER VACUUM

VACUUM SOLUTIONS FROM A SINGLE SOURCE

Pfeiffer Vacuum stands for innovative and custom vacuum solutions worldwide, technological perfection, competent advice and reliable service. We are the only supplier of vacuum technology that provides a complete product portfolio:

- Pumps for vacuum generation down to UHV
- Vacuum measurement and analysis equipment
- Leak detectors and integrity test systems
- Vacuum chambers and components
- Pumping stations and customized solutions

Are you looking for a perfect vacuum solution? Please contact us:
Pfeiffer Vacuum (India) Private Limited · T +91 40 2775 0014 · F +91 40 2775 7774
pvin@pfeiffer-vacuum.in · www.pfeiffer-vacuum.com

National Symposium for Commemorating 30-years of ADITYA Tokamak

Information Booklet

27th and 28th January 2020

Venue
Entrepreneurship Development Institute (EDI) of India, Gandhinagar

Organised by:

Institute for Plasma Research (IPR), Bhat, Gandhinagar, Gujarat
&
Department of Atomic Energy (DAE), Mumbai

Contents

Local Organizing Committee (LOC)

Name	Position
Shishir Deshpande	Chairman
Ujjwal Kumar Baruah	Member
P K Chattopadhyay	Member
C N Gupta	Member
D Raju	Member
Vipul L Tanna	Member
S Pathak	Member
Joydeep Ghosh	Member
Amit Srivastava	Member
Manoj Gupta	Member
Ranjana Manchanda	Member
Chhaya Chavda	Member
Rakesh L Tanna	Convenor

Sub-Committees

Registration	Food	Transport & Accommodation
Raju Daniel (Chair) Kumudni Tahiliani Abha Kanik Pramila Gautam Praveena Kumari Minsha Shah	Manoj Kumar Gupta (Chair) Ranjana Manchanda Dilip C. Raval Harshad Chamunde L.N. Srikanth Ketan M. Patel	A.K. Srivastava (Chair) Hitesh T. Mehta Pankaj K. Srivastava Tanmay Macwan Hiren Nimavat Kaushlender Singh
Souvenir / Booklet	**Stage & Poster preparation**	**Aditya-U Tokamak Visit**
Chhaya Chavda (Chair) Vipul L. Tanna Amulya Kumar Sanyasi Saroj Das S. Shravan Kumar Pinakine Devluk	Joydeep Ghosh (Chair) Ramasubramanian N Chhaya Chavda Hiral B Joshi Govind Lokhande Nilam Nimavat	Chhaya Chavda(Chair) Kumarpalsinh Jadeja Kaushal Patel Rohit Kumar Suman Aich Suman Dolui
Sponsorship	**Video & Photography**	**Financial Dealings**
Vipul L. Tanna (Chair) Suryakant Gupta Ranjana Manchanda Pinakine Devluk	Chhaya Chavda (Chair) Mohandas K.K. Saroj Das S. Shravan Kumar	Rakesh L. Tanna (Chair) Ranjana Manchanda Chhaya Chavda Pinakine Devluk

के. एन. व्यास
K. N. Vyas

भारत सरकार
Government of India

अध्यक्ष, परमाणु ऊर्जा आयोग
व
सचिव, परमाणु ऊर्जा विभाग
Chairman, Atomic Energy Commission
&
Secretary, Department of Atomic Energy

MESSAGE

I am happy to learn that the indigenously built ADITYA tokamak at the Institute for Plasma Research (IPR), Gandhinagar, has completed 30 years of operation. While fusion energy is an important component of our long-term energy security, the development of Societal applications of plasmas in the near term is of equal significance. IPR has been playing a major role in both areas. I congratulate all the past and present scientists of IPR for reaching this milestone. I am sure that the Symposium will ignite the minds of researchers as well as students, fostering growth in these critical areas in our country. I extend my best wishes to the organizers and participants for success of the Symposium.

(K. N. Vyas)

राष्ट्र की सेवा में परमाणु
प ऊ वि
DAE
ATOMS IN THE SERVICE OF THE NATION

अणुशक्तिभवन, छत्रपति शिवाजी महाराज मार्ग, मुंबई - 400 001, भारत • Anushakti Bhavan, Chhatrapati Shivaji Maharaj Marg, Mumbai - 400 001, India
दूरभाष/Phone:+(91) (22) 2202 2543 • फैक्स/Fax: +(91) (22) 2204 8476 / 2284 3888
ई-मेल/E-mail: chairman@dae.gov.in

डॉ. अजित कुमार मोहान्ती
Dr. Ajit Kumar Mohanty

भारत सरकार
Government of India

निदेशक, भाभा परमाणु अनुसंधान केंद्र
Director, Bhabha Atomic Research Centre
सदस्य, परमाणु ऊर्जा आयोग
Member, Atomic Energy Commission

MESSAGE

I am happy to learn that the ADITYA tokamak at the Institute for Plasma Research (IPR), Gandhinagar, has completed 30 years of operation. IPR has been playing a key role in Fusion as well as Societal applications of plasma science & technology. I am sure that the tokamak programme at IPR will continue to demonstrate the deployment of indigenously-developed technologies as well as new results in the field.

I extend my best wishes to the organizers and participants for success of the Symposium.

Ajit Kumar Mohanty

(Dr. Ajit Kumar Mohanty)

भाभा परमाणु अनुसंधान केंद्र, ट्रॉम्बे, मुंबई- 400 085, भारत • Bhabha Atomic Research Centre, Trombay, Mumbai 400 085, India
दूरभाष/Phone:+(91) (22) 2550 5300, 2551 1910 • फैक्स/Fax: +(91) (22) 2559 2107, 2550 5151
ई-मेल/E-mail: ajitkm@barc.gov.in / director@barc.gov.in

DAY 1: 27.01.2020

Time Schedule	Event	Delivered by
09:00 Hrs – 09:10 Hrs	Inauguration	Lighting of Lamp
09:10 Hrs – 09:20 Hrs	Address by Director IPR	Dr. S. Chaturvedi (Director, IPR)
09:20 Hrs – 09:35 Hrs	Address by the Chief Guest	Dr. Anil Kakodkar (Former Chairman, AEC)
09:35 Hrs – 09:45 Hrs	Unveiling of Souvenir and Plasma Cartoon book	By Dr. Anil Kakodkar (Former Chairman, AEC)
09:45 Hrs – 10:05 Hrs	Key Note-1	Dr. R. Grover (Homi Bhabha Chair, DAE, HoD ITER Council)
10:05 Hrs – 10:35 Hrs	Key Note-2	Prof. A. Sen (Emeritus Professor & INSA Sr. Scientist)
10:35 Hrs – 11:00 Hrs	High Tea	
11:00 Hrs – 11:20 Hrs	ADITYA Construction & Operation	Prof. P. I. John (IPR)
11:20 Hrs – 11:40 Hrs	ADITYA Operations & Experiments	Prof. Y. C. Saxena (IPR)
11:40 Hrs – 12:00 Hrs	ADITYA – Early Diagnostics	Prof. R. Pal (SINP)
12:00 Hrs – 12:20 Hrs	ADITYA-U Diverter	Dr. R. Srinivasan (IPR)
12:20 Hrs – 12:40 Hrs	ADITYA-U: Operation & Experiments	Dr. J. Ghosh (IPR)
12:40 Hrs – 13:00 Hrs	RF experiments in ADITYA/ADITYA-U	Prof. P. K. Chattopadhyay (IPR)
13:00 Hrs – 14:15 Hrs	Lunch	
14:15 Hrs – 15:30 Hrs	Panel Discussion (Enhancing University participation in ADITYA-U experiments)	Prof. Shishir Deshpande
15:30 Hrs – 16:00 Hrs	Tea/Coffee	
16:00 Hrs – 16:20 Hrs	Magnets for Charged Particle Beams	Mr. S. Malhotra (BARC)
16:20 Hrs – 16:40 Hrs	Novel Pellet Injection Experiments	Dr. S. Pahari (BARC-Vizag)
16:40 Hrs – 17:00 Hrs	ADITYA/ADITYA-U - Pulsed Power System	Dr. Balakrishnan V Nair (IPR)
17:00 Hrs – 17:20 Hrs	ADITYA/ADITYA-U – Vacuum System	Mr. S. B. Bhatt (IPR)
17:20 Hrs – 17:40 Hrs	ADITYA Support structure & Mechanics	Mr. Bharat Doshi (IPR)
18:00 Hrs – 19:00 Hrs	ADITYA-U visit	All Participants/Guests
19:30 Hrs – 21:00 Hrs	Dinner	

DAY 2: 28.01.2020

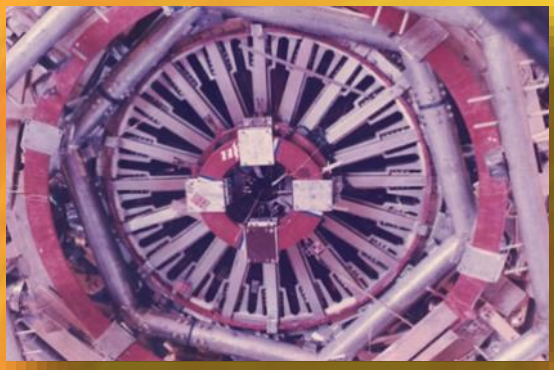
Time Schedule (DAY 2)	Event	Delivered by
09:30 Hrs – 09:50 Hrs	On Fast Data Acquisition systems	Mrs. A. Behere (BARC)
09:50 Hrs – 10:10 Hrs	ADITYA Electronics & Data acquisition	Mr. Harshad Pujara (IPR)
10:10 Hrs – 10:30 Hrs	ADITYA – Electrical Subsystems	Mr. K. Sathyanarayana (IPR)
10:30 Hrs – 10:50 Hrs	Gyrotron Development	Dr. R. K. Sharma (CEERI Pilani)
10:50 Hrs – 11:15 Hrs	High Tea	
11:15 Hrs – 11:35 Hrs	RF physics and application	Prof. A. K. Ganguly (IIT Delhi)
11:35 Hrs – 11:55 Hrs	ADITYA-U Pre-ionization & start-up	Mr. B. K. Shukla (IPR)
11:55 Hrs – 12:15 Hrs	ICR Heating	Dr. S. V. Kulkarni (IPR)
12:15 Hrs – 12:35 Hrs	LH Current Drive	Dr. Pramod Sharma (IPR)
12:35 Hrs – 12:55 Hrs	Freq. modulated Reflectometer	Dr. A. Amalin Prince (BITS-Pilani, Goa)
13:00 Hrs – 14:15 Hrs	Lunch	
14:15 Hrs – 14:35 Hrs	ADITYA – Modelling Studies	Dr. Indranil Bandyopadhyay (IPR)
14:35 Hrs – 14:55 Hrs	Impurity Gas Injection Studies	Dr. Nirmal Bisai (IPR)
14:55 Hrs – 15:15 Hrs	ADITYA Diagnostics progress	Dr. CVS Rao (IPR)
Tea/Coffee break (in parallel with poster session)		
15:15 Hrs – 17:30 Hrs	Poster Session	
Concluding Session		
17:30 Hrs – 17:45 Hrs	Conclusion/vote of thanks	Mr. R. L. Tanna (IPR)

List of Sponsors

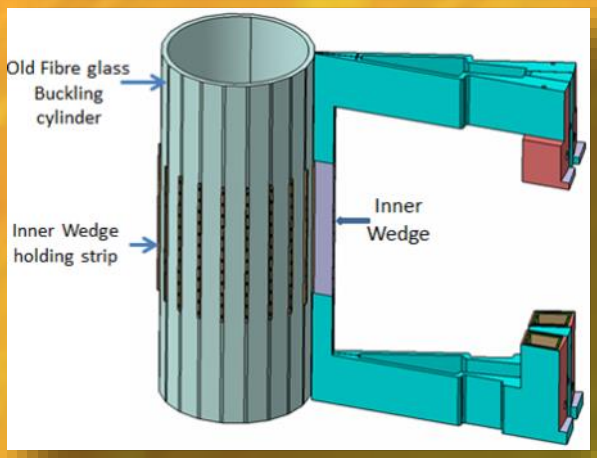
- Allied Publishers Group
- ATOS Instruments Marketing Services & ATOSCOPE Instruments Pvt. Ltd.
- Cryogas Equipment Private Limited
- Magnewin Energy Pvt. Ltd.
- MICROCON Automation & Process Control
- Optimized Solutions Limited
- Pfeiffer Vacuum (India) Private Limited
- Plasma & Vacuum Technologies
- State Bank of India

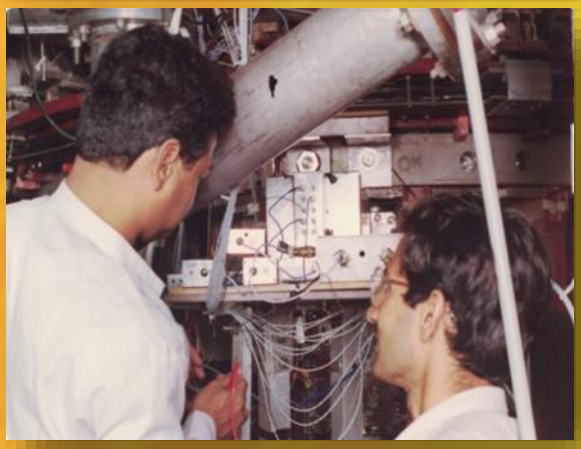
Initial Civil Erection and Building infrastructure Activities in 1986

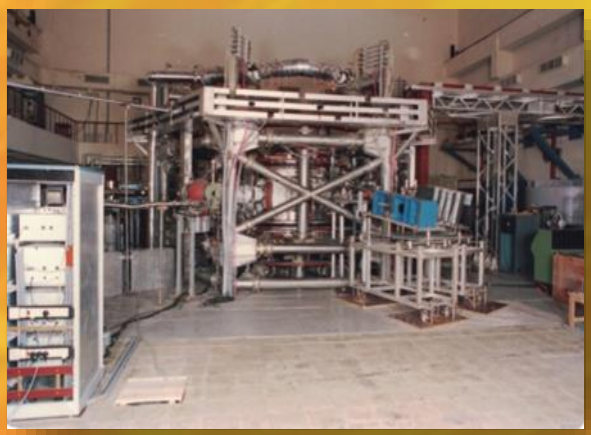
ADITYA & APPS Power Station and ADITYA Tokamak Assembly



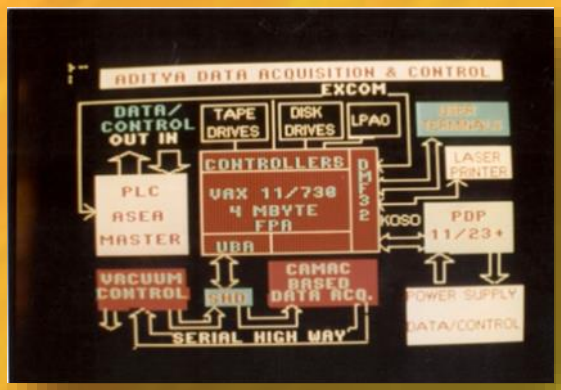
ADITYA Tokamak, Capacitor bank and Diagnostic Systems

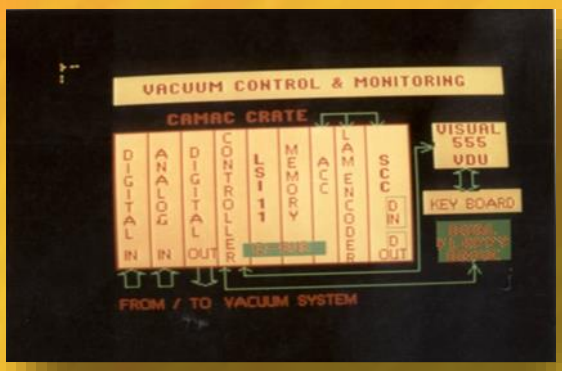


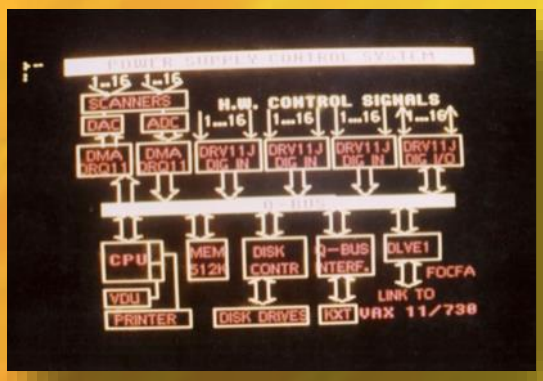


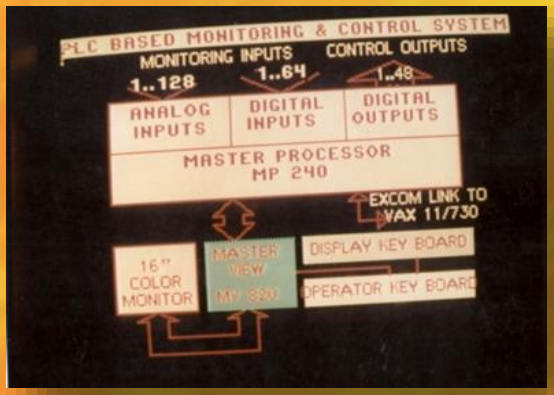


ADITYA Tokamak Data Acquisition and Control System

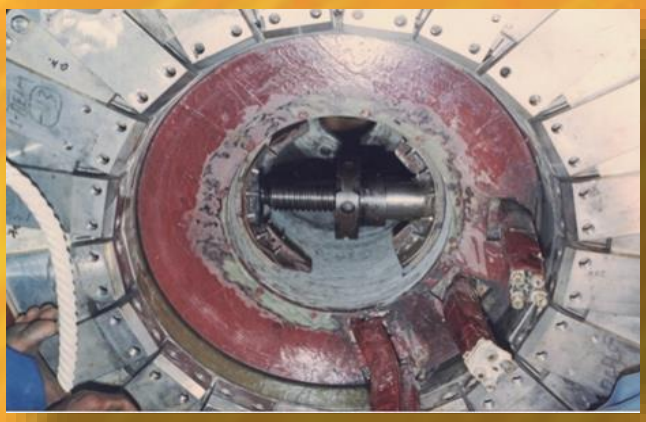


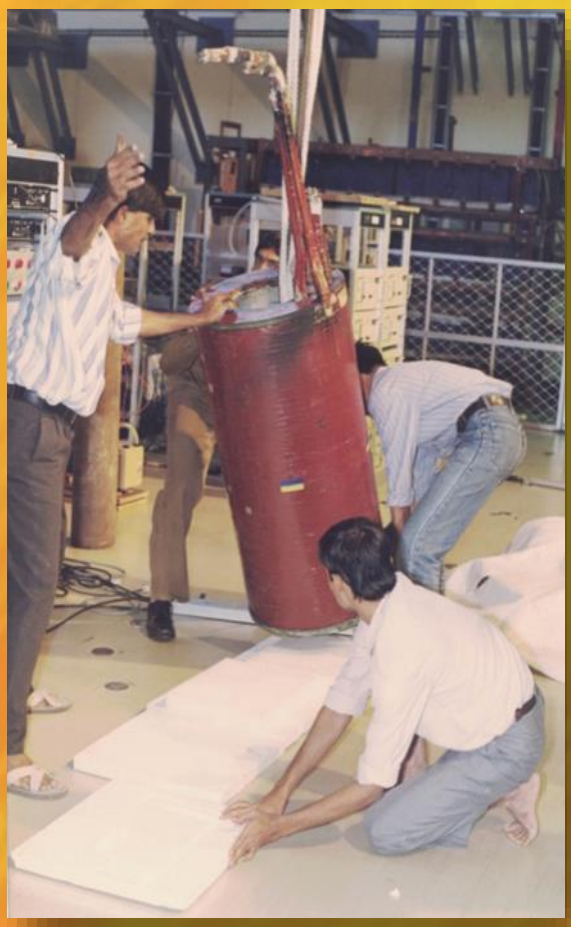


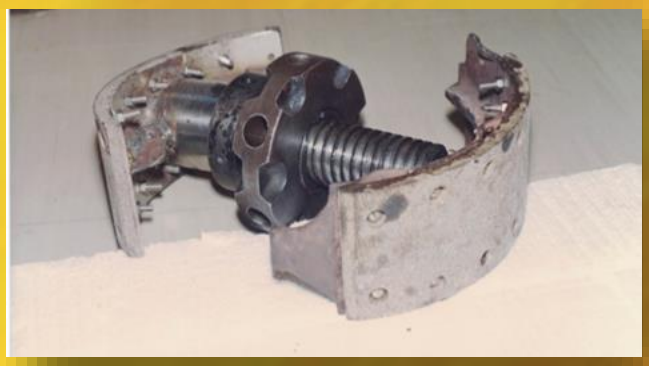




Removal of Central Solenoid (TR1) Coil (1997)







Important Results from ADITYA Tokamak

30000 APPS DISCHARGES

HIGHLY SUCCESSFUL OPERATION

8000 CB DISCHARGES

Publications	Publications in Conferences / Symposium	Research Reports	PhDs
~ 150	~ 700	~ 75	10

"BURSTY" nature of plasma transport in Tokamaks has been shown for the first time to the world in ADITYA

Confirmed Worldwide Later

(Physical Review Letters, Volume 69, Number 9, 1992)

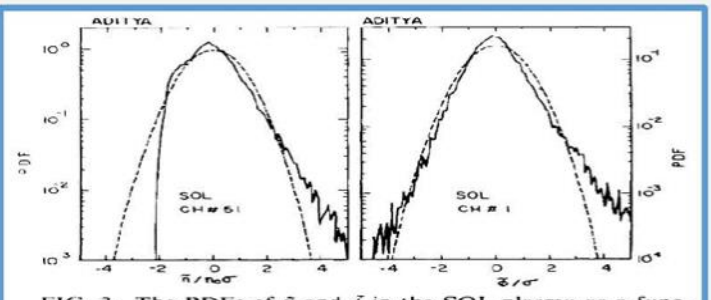
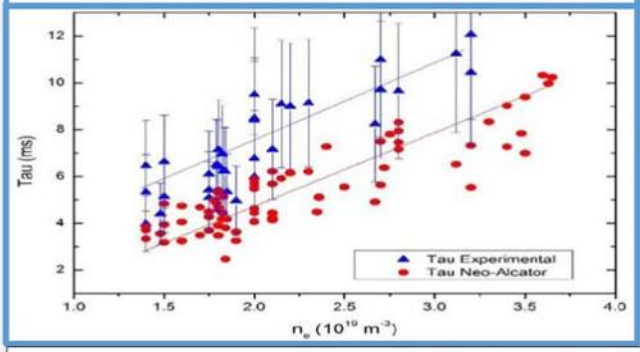
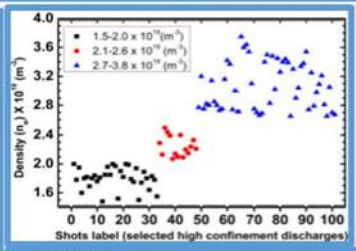
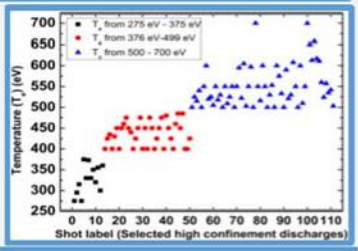


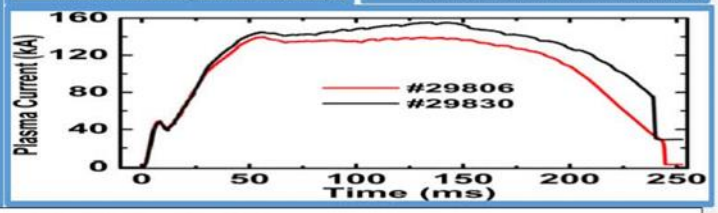
FIG. 3. The PDFs of $\tilde{n}$ and $\tilde{\phi}$ in the SOL plasma as a function of fluctuation amplitude normalized to the respective standard deviation (σ). The dashed curves represent Gaussians with the same σ.

Higher Energy Confinement Time than Neo-Alcator Scaling



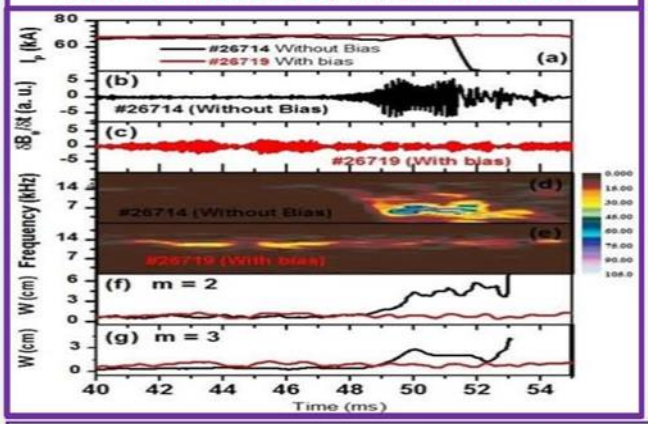




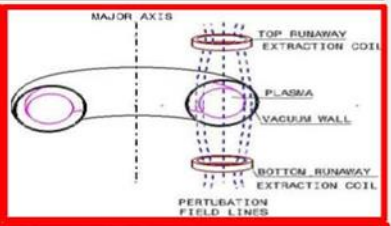


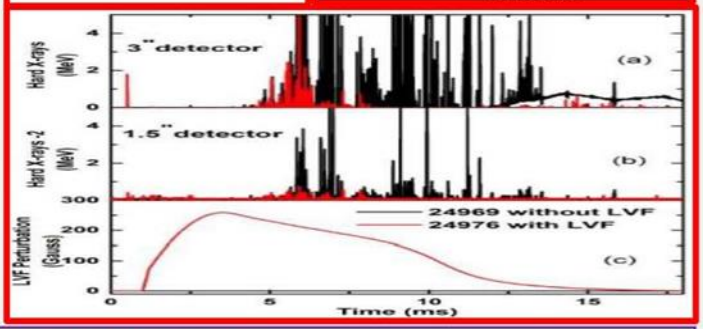
Nuclear Fusion 57 (2017) 102008

MHD generated disruptions in Aditya are successfully mitigated with sheared rotation induced by biased electrode



Runaway Mitigation: by short localized vertical magnetic field perturbation





Nuclear Fusion 55 (2015) 063010

ADITYA Upgrade Tokamak

The Aim:

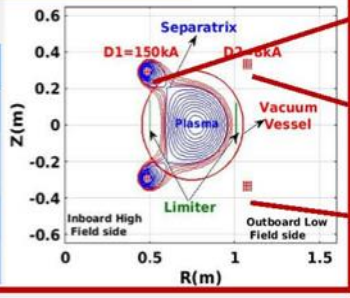
- ✓ *A small/mid-size tokamak with Divertor Configuration (single & double null)*
- ✓ *To carry out experiments relevant for large size Machines (runaways, disruption etc.)*
- ✓ *Easier access and Smaller duty cycle*

Divertor coil locations identified using plasma equilibrium reconstruction code IPREQ

Divertor coils

ADITYA Upgrade Parameters:

Major radius (R)	0.75 m
Minor radius (a)	0.25 m
Plasma Shape	Circular / Shaped
Toroidal Field	1.5 T
Plasma Current	150 - 250 kA



New circular shape vacuum vessel

ADITYA Dis-assembly started–April,15

ADITYA operated for 25 Years

Dis-assembly completed – June, 15

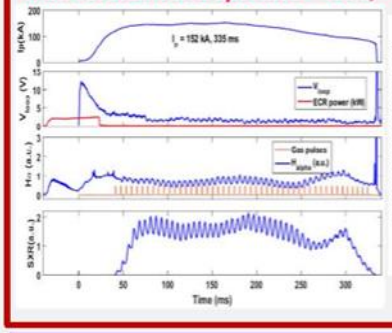
ADITYA dismantled

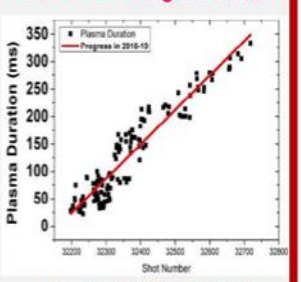
ADITYA-U assembly completed–Mar.,16

ADITYA-U operation started - Dec.16

Important Results from ADITYA Upgrade Tokamak

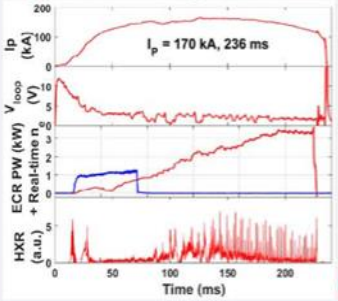
Max. Toroidal Field operated ~ 1.4 T, ~ 93% of the designed value

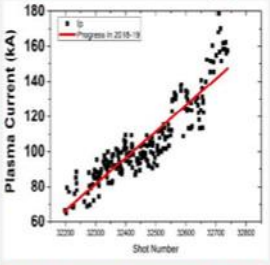




Max. Duration ~ 335 ms

High Current, Long duration discharges in ADITYA Upgrade





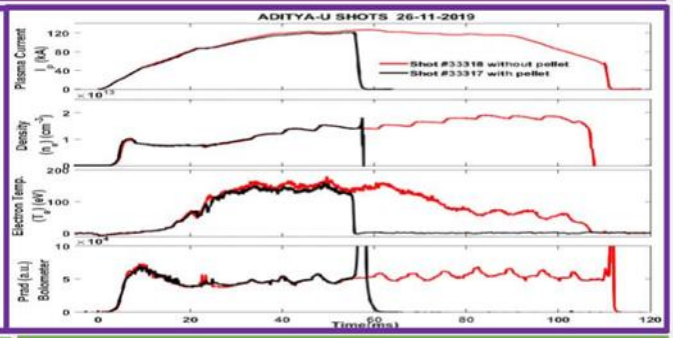
Max. Plasma Current ~177 kA

Nuclear Fusion 59 (2019) 112006

Electromagnetic Pellet Injector (Li_2TiO_3) Experiment in ADITYA-U

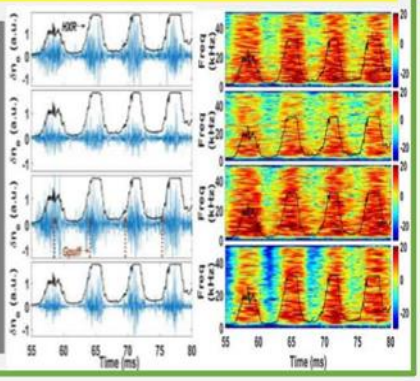
First time an electromagnetic pellet injector used to fire the pellets into the tokomak

Significant development towards ITER disruption control

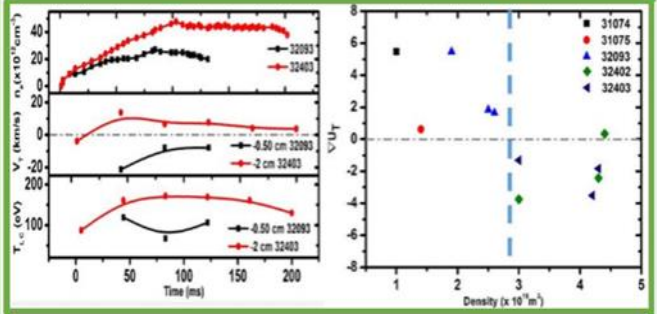


TURBULENT FLUCTUATIONS INDUCED RUNAWAY ELECTRON LOSS

Significant Suppression of Runaway Electron Loss by Suppression of Edge Density and Potential Fluctuations using Periodic Gas puffs

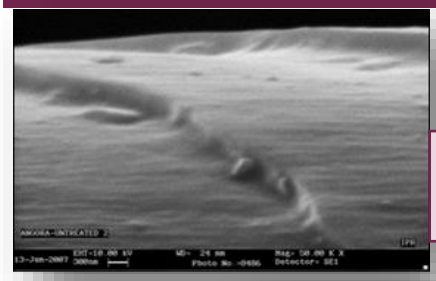


Plasma Toroidal Rotation Reversal

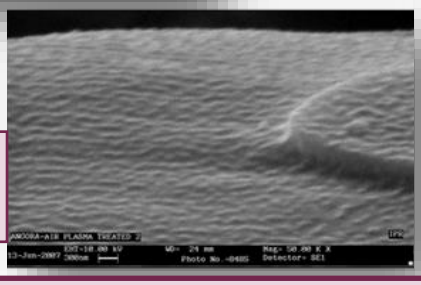


Nuclear Fusion 59 (2019) 106049

Societal Application of Plasma Technology



Untreated Angora Fibre

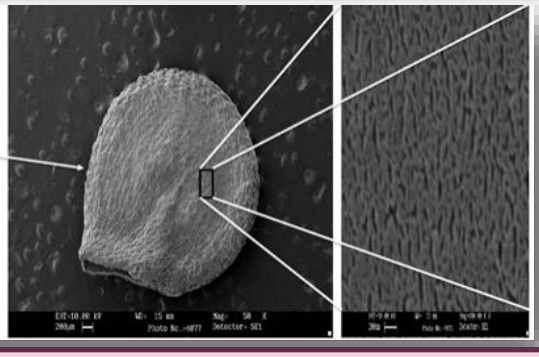


Plasma Treated Angora Fibre

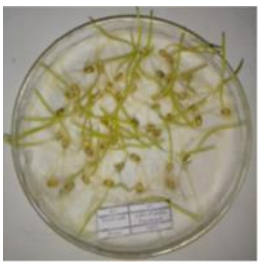
Plasma Textile Applications

Plasma Pyrolysis System

Plasma Jet for Medical Applications



Untreated Wheat seeds



Plasma treated Wheat seeds

Plasma for Agriculture Applications

List of Abstracts - NSC30AT2019

Design, Fabrication And Installation Of Support Structure For Reflectometry Diagnostics on Aditya-U Tokamak
Pratibha Gupta, Manoj Kumar Gupta, Bharat Doshi, J.J.U.Buch, S.K.Pathak*

Charge Exchange Neutral Particle Analyzer (CX-NPA) diagnostic measurements in ohmic as well as Ion cyclotron resonance heated plasma discharges in Aditya
Snehlata Aggarwal Santosh Pandya and Kumar Ajay*

Comparative study of perpendicular and tangential viewing Soft X-ray tomographic reconstruction for Aditya tokamak MHD Equilibrium and Stability
Shishir Purohit and Manoj Kumar Gupta

Field simulation of Ohmic Ramp down in ADITYA – Need for Correction Coils for improvement of Magnetic Null
Amardas Alli

ADITYA Vacuum Monitoring and Control System
Kiran Patel, K.A. Jadeja, Kaushal Patel, H.C. Joshi & Joydeep Ghosh

Whistlers: A Probable Mechanism to Mitigate Runaway Electrons in Tokamaks
A. K. Sanyasi, Prabhakar Srivastav, L. M. Awasthi, P. K. Srivastava, R. Sugandhi and D. Sharma

Effect of Superthermal Electrons on Ion-Acoustic Wave in Negative Ion Plasmas
J. K. Chawla

Effect of Superthermal Electrons and Positrons on Ion-Acoustic Double Layers in Magnetized Plasmas
P. C. Singhadiya and J. K. Chawla*

Plasma Position Estimation Using Magnetic Diagnostics in ADITYA-U
S. Aich, R. Kumar, T. M. Macwan, D. Kumavat, S. Jha, R. L. Tanna, Sathyanarayana K., J. Ghosh, K. A. Jadeja, K. Patel, Sharvil Patel, Vaibhav Ranjan, Madanlal Kalal, Dinesh Varia, D. Sadharkiya, D. Raju, P. K. Chattopadhyay, C. N. Gupta , Y. C. Saxena and ADITYA-U team*

Iron Impurity Behaviour Study in the ADITYA Tokamak
A. K. Srivastava, S. Patel, M. B. Chowdhuri, R. Manchanda, J. V. Raval, U. Nagora, P.K. Atrey, R. L. Tanna, J. Ghosh and ADITYA Team

3D simulation in Aditya Scrape-off layer using steady state model EMC3- EIRENE
Bibhu Prasad Sahoo, Devendra Sharma and Ratneshwar Jha

Tungsten Coating Deposition on Graphite and Process Optimization
P A Rayjada, K. A. Jadeja, N. L. Chauhan, S. B. Bhatt

Analytical Model for Erosion Driven Carbon Sources in Tokamaks
P. N. Maya and S. P. Deshpande

Infrared Imaging Video Bolometer diagnostics in Aditya tokamak
Santosh P. Pandya, Shwetang N. Pandya, Kumudni Tahiliani, S. K. Pathak and Aditya team

Investigation of Impurity Seeded ADITYA & ADITYA-U Tokamaks Plasmas
M. B. Chowdhuri, J. Ghosh, R. L. Tanna, K. A. Jadeja, K. M. Patel, R. Manchanda, N. Yadava, S. Patel, G. Shukla, K. Shah, R. Dey, N. Ramaiya, Tanmay Makwan, U. C. Nagora, S. K. Pathak, J. V. Raval, S. Purohit, M. K. Gupta, S. K. Jha, M. V. Gopalakrishna, K. Tahiliani, Rohit kumar, Suman Aich, Suman Dolui, Kaushlender Singh, P. K. Atrey, B. V. Nair, C. N. Gupta, P. K. Chattopadhyay, ADITYA Team and ADITYA-U Team

Investigation of atomic and molecular processes in ADITYA and ADITYA-U tokamak plasmas
Ritu Dey, J. Ghosh, M. B. Chowdhuri, Ranjana Manchanda, Nandini Yadava, R.L.Tanna, Santanu Banerjee, P. Vasu, Vinay Kumar and Aditya Team

Population-Alignment Collisional-Radiative Model for Polarization in Lyman-α Line
Nilam Ramaiya and Motoshi Goto

Electronics for Langmuir Probe in Aditya-U for the measurement in the SOL layer.
Pramila, Tanmoy, Harshita, Lavkesh, Shwetang, Rachana Rajpal

Role of Poloidal Flows on the Particle Confinement in a Current-less Toroidal Device
Umesh Kumar, R. Ganesh, K. Sathyanarayana, Y. C. Saxena and D. Raju

Investigation of Neutral Recycling and Ion Temperature of Various Plasma Species in ADITYA and ADITYA-U Tokamak
Nandini Yadava, J. Ghosh, M. B. Chowdhuri, R. Manchanda, Sripathi Punchithaya K, Ismyil, Ritu Dey, Tanmay Macwan, S. Patel, N. Ramaiya, K. A. Jadeja, R. L. Tanna and Aditya-U

Study Small Amplitude Ion-Acoustic Solitons in Negative Ion Plasmas with Superthermal Electrons
P. C. Singhadiya

Topology Optimization of a Planetary Gearbox for Fusion RH Application
Ratna .A. Rajgor, Manoah Stephen M, Krishan Kumar Gotewal, Hitesh .K. Patel

Passive Charge eXchange (PCX) Spectroscopy to Measure Plasma Rotation on Aditya-U Tokamak
G Shukla, K Shah, M.B.Chowdhuri, R Manchanda, R.L. Tanna, K.A. Jadeja, K.B.K. Mayya, J Ghosh and Aditya-U team

Characterization of Ohmic Breakdown Phase for the ADITYA discharges
Sharvil Patel, Joydeep Ghosh, R. L. Tanna, P.K. Chattopadhyay, Harshita Raj, M. B. Chowdhuri, Ranjana Manchanda, Nilam Ramaiya, Umesh Nagora, P. K. Atrey and Aditya Team

An Estimation Of The Edge Impurity Transport In The ADITYA Tokamak Through Comparison Between The Simulated and Analytical (Model–Based) Edge Impurity Diffusion Coefficients
Amrita Bhattacharya[*], Joydeep Ghosh, Malay Bikas Chowdhuri, Prabhat Munshi and the ADITYA team

ECRH Power Supply System for Aditya Tokamak\
Mahesh Kushwah, B K Shukla, KG Parmar, Jatin Patel, Harshita Patel,Dharmesh Purohit and Hardik Mistry

Indigenously Developed Data Acquisition System For Plasma Diagnostics In Aditya-U Tokamak
Praveena kumari Shukla, Vismaysinh Raulji, Hitesh Mandaliya, Rachana Rajpal, Pramila, Praveenlal E.V, C.J Hansalia

Gas Puff Induced Drift Waves In ADITYA And ADITYA-U Tokamak
Tanmay Macwan, Harshita Raj, Kaushlender Singh, Suman Dolui, J. Ghosh, R. L. Tanna, Rohit Kumar , Suman Aich, Lavkesh Lachhvani, Pramila Gautam, K. A. Jadeja, K. M. Patel, N C Patel, V Panchal, Umesh Nagora, P. K. Atrey, S. K. Jha, D. Raju and ADITYA-U Team

Laser Heated Emissive Probes Diagnostic in ADITYA – U TOKAMAK
Abha Kanik, Arun Sarma, Joydeep Ghosh , Tanmay Macwan, R. L. Tanna, Minsha Shah, Ranjana Manchanda, Payal Pandit, Shwetang Pandya, Jayesh Raval, Umesh Nagora and ADITYA-U Team

ADITYA Upgrade New Circular Shaped Torus Vacuum Vessel and Pumping System
K. A. Jadeja , S. B. Bhatt, K. M. Patel, J. Ghosh, V. R. Prajapati, Kulav Rathod, K. S. Acharya, Kiran Patel, B. G. Arambhadiya, R. L. Tanna, M. B. Kalal, D.S. Varia, D.H. Sadhrakiya, P. K. Chattopadhyay, Y. C. Saxena, A.Das, D. Bora

Control System Development for LIGO outgassing setup
S.Sunil, Faiz Mohammed Masi, Sabbir Ahmed, Gaurav Kumar Singh and Subroto Mukherji

Water Cooling System of ADITYA Tokamak
Yagneshkumar Trivedi, M. Vasani, S. K. Sharma, K. Padia and J.M. Gandhi

The Refurbishment of Damaged Toroidal Magnetic Field coils for ADITYA-U
D.H. Sadharakiya, R.L. Tanna, J. Ghosh, B.R. Doshi, P.K. Chattopadhyay, Sharvil Patel, Vaibhav Ranjan, Rohit Kumar, Harshita Raj, K. Sathyanarayana, M.B. Kalal, D.S. Varia, Ram Krushna Panchal, Kulav Rathod, S.B. Bhatt, A.Vardharajulu, Y. C. Saxena, and Shell-N-Tube Team

Study of Argon Line Emissions in ADITYA-U Tokamak using Spectroscopic Diagnostic
K. Shah[1], M. B. Chowdhuri[2], G. Shukla[1], R. Manchanda[2], K. A. Jadeja[2], N. Yadava[3], N. Ramaiya[1], K. M. Patel[2], R. L. Tanna[2], K. B. K. Mayya[1], J. Ghosh[2] and ADITYA-U[2] team

Real-time Horizontal Plasma Position Control in ADITYA –U

Rohit Kumar, Pramila Gautam, Shivam Gupta, Tanmay Macwan, Praveen Lal E.V., Minsha Shah, Ranjana Manchanda, M. B. Chowdhuri, Nandini Yadav, Kunal Shah, M. N. Makwana, V. Balakrishnan, C. N. Gupta, R. L. Tanna, Suman Aich, Devilal Kumawat, K. Sathyanarayana, S. Jha, D. Raju, Joydeep Ghosh, P. K. Chattopadhyay, Y. C. Saxena and the ADITYA –U Team.

Large amplitude ion acoustic Solitons in warm negative ion plasmas with Maxwellians electrons.
Kishan Kumar and M. K. Mishra

Preliminary Study of Supersonic Molecular Beam Injection In ADITYA-U Tokamak.
Kaushlender Singh, Suman Dolui, Tanmay Macwan, K A Jadeja, K M Patel, Harshita Raj, Suman Aich, Rohit Kumar, B Arambhadiya, Siju George, Y Pravastu, D C Raval, V K Panchal, Jayesh Raval, D. Raju, S.K. Jha, R L Tanna, J Ghosh and ADITYA-U Team

Experimental Investigation on Electron Temperature Gradient Driven Instability in the Curvature Magnetic Field of MPD
A. D.Patel, Meenakshee sharma, N.Ramasubramanian, Lavkesh Lachhvani, Y. C. Saxena, R. Ganesh, P. K. Chatopadhaya

Spectroscopic Diagnostic for Magnetic Field in Tokamak Plasma
Subir Biswas

Study of ADITYA-U Tokamak Plasma using Fast Imaging Camera
Devilal Kumawat[1], Kumudni Tahiliani, Sameer Kumar, Gopalakrishna M V, Santosh Pandya, S.K Pathak and ADITYA-U Team*

Design And Development of Different Analog And Digital Electronic Circuits For ADITYA Tokamak
Minsha Shah, Praveenlal E.V., Hitesh Mandaliya, Vismay Raulji, C J Hansalia, Rachana Rajpal and Electronics Group, R L Tanna, J Ghosh and Aditya team*

Homodyne and Heterodyne Microwave Interferometer Systems for ADITYA Tokamak
Umesh Nagora, S.K.Pathak, P.K.Atrey and Aditya Team

Non-linear Time Series Analysis of ADITYA-U Plasma discharges
Balamurali Krishna, Mayya Kolake, Sharvil Patel, Tanmay Macwan, M.B. Choudhury, R. Manchanda, J. Ghosh, and Sameer Kumar

Investigations of Plasma Disruption Prediction in Tokamak using Machine Learning Tools
Yogesh Meghrajani, Himanshu Mazumdar, Indranil Bandyopadhyay, Satvik patel, Jignasa Patel and Aditya Team

X-Ray Diagnostics Systems in ADITYA/ADITYA-U Tokomak
Jayesh Raval, S. Purohit, M. K. Gupta, Y.S. Joisa, Praveena kumari, Minsha Shah,Vishmay Raulji, Imran Mansuri, Manisha Bhandarkar, K. A. Jadeja, K. M. Patel, V.K.Panchal, R.L. Tanna, J. Ghose, R. Rajpal, K.Mahajan, Aditya Team

Self inductance of finite straight wire using Biot-Savart's law
Ashvin Mali

Self-Inductance of Circular Loop using Biot-Savart's Law
Deenganesh Mali

Design of Interlock Systems For Real Time Control Of Plasma Events And Experiments In Aditya Tokamak
Praveenlal Edappalli, Minsha Shah, Rachana Rajpal, K.A. Jadeja, Rohit Kumar, Suman Aich, Tanmay Macwan, K.M. Patel, R. L. Tanna, J. Ghosh and Aditya Team

Limiter and Divertor of ADITYA-U tokamak
K. M. Patel, K. A. Jadeja, J. Ghosh, R. L. Tanna, S. B. Bhatt, Deepti Sharma, R. Shrinivasan, Y. C. Saxena, Rohit Kumar, Suman Aich, Tanmay Macwan, Kaushlender Singh, Suman Dolui and ADITYA-U Team

Forecasting of Disruption in ADITYA-U Tokamak
Suman Dolui, Kaushlender Singh, Tanmay Macwan, Harshita Raj, Suman Aich, Rohit Kumar, K A Jadeja, K M Patel, V K Panchal, D. Raju, Jayesh Raval, S.K. Jha, R L Tanna, J. Ghosh and ADITYA-U Team

Recent advances and Upgradation of ICRH System on ADITYA-U
Kishore Mishra, Atul Varia, H. M. Jadhav, Sunil Kumar, and ICRH Team[*].

Mechanical Design of a Pressurized Variable Pre-matching Stub for ICRH System on ADITYA-U
Atul Varia, Kishore Mishra, Sunil Kumar, and ICRH Team[*]

Ph.D. Thesis contributed from ADITYA Tokamak

Sr. No.	Name of Doctoral Students / Title of Thesis
1	JOSEPH, BIJU K./Electrostatic Turbulence in Toroidal Plasma (2001)
2	RAJU, D./Study of Plasma Equilibrium and MHD Instability In ADITYA Tokamak (2002)
3	PANDYA, HITESH KUMAR/Studies on Electron Cyclotron Emission from Fusion Plasma (2008)
4	DEEPAK SANGWAN/Studies of Plasma Flows in Scrape-Off Layer Plasma of Aditya Tokamak (2013)
5	PRAVESH DHYANI/Biased Electrode Experiments in Aditya Tokamak (2014)
6	BIBHU PRASAD SAHOO / 3D Simulations and Analysis of Plasma Transport in the Scrape-Off Layer of Tokamak Aditya (2017)
7	PRAVEEN KUMAR ATREY / Design and Development of Microwave Interferometer and Reflectometer Systems for Plasma Diagnostics in Tokamak (2019)
8	HARSITA, RAJ / Study of Generation and Transport of Runaway Electrons In Aditya And Aditya-U Tokamak (Thesis submitted)
9	AMRITA BHATTACHARYA / A novel approach towards solution of the radial impurity transport equation in tokamak plasma with a semi–implicit numerical method and an estimation of impurity transport in the Aditya tokamak (Thesis Submitted)
10	TANMAY MECWAN/ Turbulence and Transport Study in ADITYA-U Tokamak (In Process)
11	GAURAV SHUKLA / Study of Plasma Rotation on ADITYA-U tokamak (In progress)
11	KAJAL SHAH / Plasma Rotation and Impurity Transport Study in X-ray Crystal Spectroscopy. (In Process)
12	SAPNA MISHRA / The study of impurities transport in tokamak plasma using Spectroscopic diagnostic (In process)
13	ABHA KANIK / Direct measurement of plasma potential and its fluctuations by Laser Heated Emissive Probes in ADITYA tokamak (In process)
14	KUMARPALSINH JADEJA / Synthesis and Studies on Some Surface Conditioning Materials and Techniques for Tokamak and Laboratory Vacuum Systems (In process)
15	SHARVIL PATEL / Study of impurity transport in the ADITYA-U tokamak (In process)
16	SUMAN DOLUI / Forecasting of Disruptions in ADITYA-U Tokamak (In Process)
17	KAUSHLENDER SINGH / Effect of Super Sonic Molecular Beam Injection in ADITYA-U Tokamak (In process)
18	VARSHA SIJU / Study of electron dynamics in tokamak plasma through EC emission using Radiometer (In Process)
19	UMESH NAGORA / Study of transport and turbulence in tokamak plasma using microwave Interferometer system (In Process)
20	KIRAN PATEL / FPGA based Signal Processing Techniques for Interferometer System (In Process)
21	JANMEJAY BUCH / Experimental and theoretical/computational studies in density and temperature fluctuations of Edge/SOL region of tokamaks (In Process)

List of ADITYA Publications (1989-2019)

"Investigation of the behavior of effective charge of Aditya tokamak Plasmas", M.B. Chowdhuri, R. Manchanda, J. Ghosh, K.A. Jadeja, K.M. Patel, Vinay Kumar, Ketan Patel, P.K. Atrey, Y.S. Joisa, S.B. Bhatt, R.L. Tanna, accepted for publication in - **Plasma Phys. Control Fusion**

"Effect of periodic gas-puffs on drift-tearing modes in ADITYA/ADITYA-U Tokamak discharges", Harshita Raj, T. Macwan, Kaushlender Singh, Suman Dolui, J. Ghosh, N.K. Bisai, K.A. Jadeja, K.M. Patel, N.C. Patel, R. L. Tanna, D. Raju, S.K. Jha, P.K. Chattopadhyay, A. Sen, R. Pal, and ADITYA-U Team, **accepted for publication in – Nuclear Fusion**

"Electrical Model of ADITYA-U Tokamak", Devilal Kumawat, Rohit Kumar, J. Ghosh, R.L Tanna, Accepted for publication in **Indian Journal of Physics.**

"The data acquisition and control system for the operation of ASDEX pressure gauge for the measurement of neutral pressure in ADITYA Tokamak", Kiran Patel, K.A. Jadeja, H.C. Joshi, J. Ghosh, **Fusion Engineering & Design, Vol. 148 (November-2019) 111256** DOI: https://doi.org/10.1016/j.fusengdes.2019.111256

"A Study of the O4+ Emissivity Profiles with Two Separate Photon Emissivity Coefficient Databases and a Comparison of the Impurity Diffusion Coefficients in the Aditya Tokamak", Amrita Bhattacharya, J. Ghosh, M. B. Chowdhuri, Prabhat Munshi, Izumi Murakami and the Aditya Team, **Plasma and Fusion Research: Regular Articles Volume 14, 1403155 (October-2019)** DOI: https://doi.org/10.1585/pfr.14.1403155

"Modeling of the Hα Emission from ADITYA Tokamak Plasmas", Ritu Dey, M.B. Chowdhuri, J. Ghosh, R. Manchanda, Nandini Yadava, U.C. Nagora, P.K. Atrey, J.V. Raval, Y.S. Joisa, R.L. Tanna and ADITYA Team, **Atoms 2019, 7(3), 95 (2019**) DOI: ***https://***doi.org/10.3390/atoms7040095

"Poloidal Rotation and Edge Ion Temperature Measurements Using Spectroscopy Diagnostics on ADITYA-U Tokamak", G. Shukla, M.B. Chowdhuri, K. Shah, Nandini Yadava, R. Manchanda, K.A. Jadeja, R.L. Tanna, K.B.K. Mayya, J. Ghosh and ADITYA-U Team, **Atoms 2019, 7(3), 93 (2019)** DOI: https://doi.org/10.3390/atoms7030093

"Evaluation of an Oxygen Transport Coefficient in the Aditya Tokamak Using the Radial Profile of O4+ Emissivity and the Importance of Atomic Data Used Therein", M.B. Chowdhuri, J. Ghosh, Ritu Dey, Sharvil Patel, Nandini Yadava, Ranjana Manchanda, Amrita Bhattacharya, Izumi Murakami and Aditya Team, **Atoms 2019, 7(3), 90** DOI: https://doi.org/10.3390/atoms7030090

"Spatial Profile of Neutral Temperature Measurement in ADITYA-U Tokamak Plasmas", Nandini Yadava, J. Ghosh, M.B. Chowdhuri, R. Manchanda, Sripathi Punchithaya K, R. Dey, K.A. Jadeja, R.L. Tanna, Deepti Tripathi, **Atoms 2019, 7(3), 87 (2019)** DOI: https://doi.org/10.3390/atoms7030087

"Dynamics of Neon Ions after Neon Gas Seeding into Tokamak Plasma", N. Bisai, M.B. Chowdhuri, S. Banerjee, H. Raj, R. Dey, R.L. Tanna, R. Manchanda, K.A. Jadeja, J. Ghosh, Aditya team, **Nucl. Fusion 59 (2019), 126013 (10pp)** DOI: https://doi.org/10.1088/1741-4326/ab3d31

"Observations of Toroidal Plasma Rotation Reversal in ADITYA-U Tokamak", G. Shukla, K. Shah, M.B. Chowdhuri, H. Raj, R. Manchanda, U. Nagora, R.L. Tanna, K. Jadeja, K.M. Patel, K.B.K. Mayya, P.K. Atrey, J. Ghosh and Aditya-U Team, **Nucl. Fusion 59 (2019), 106049 (8pp)** DOI: https://doi.org/10.1088/1741-4326/ab3518

"Observation of Poloidal asymmetry in measured neutral temperatures in ADITYA-U tokamak plasma", Nandini Yadava, J. Ghosh, M.B. Chowdhuri, R. Manchanda, Sripathi Punchithaya, R. Dey, H. Raj, S. Banerjee, R. L. Tanna, K. A. Jadeja, K. M. Patel, R. Kumar, Deepti Tripathi and Aditya - U team, **Nucl. Fusion 59 (2019), 106003 (8pp)** DOI: https://doi.org/10.1088/1741-4326/ab2d57

"Study of Iron impurity behaviour in the ADITYA tokamak", Sharvil Patel, A.K. Srivastava, M.B. Chowdhuri, R. Manchanda, A. Bhattacharya, J.V. Raval, U.C. Nagora, P.K. Atrey, R.L. Tanna, J. Ghosh and the Aditya team, **Nucl. Fusion 59 (2019), No. 8, 086019 (8pp)** DOI: https://doi.org/10.1088/1741-4326/ab1f12

"Novel Approach of Pulsed-Glow Discharge Wall Conditioning in ADITYA Upgrade Tokamak", K. A. Jadeja**,** Kiran Patel**,** K. M. Patel**,** B. G. Arambhadiya**,** J. Ghosh**,** R. L. Tanna, K.S. Acharya**,** S.B. Bhatt**,** M.B. Chowdhuri**,** R. Manchanda**,** Minsha Shah**,** S. Ghosh**,** Vara Prasad Kella**,** T. Macwan**,** H. Raj, R. Kumar**,** S. Aich**,** D. Kumawat**,** M.B. Kalal**,** R. Rajpal**,** C. N. Gupta**,** P.K. Chattopadhyay, B.R. Kataria, Y.C. Saxena and Aditya-U Team, **Nucl. Fusion 59 (2019), No. 8, 086005 (8pp)** DOI: https://doi.org/10.1088/1741-4326/ab1ab6

"Overview of Operation and Experiments in the ADITYA-U tokamak", R.L. Tanna, H. Raj, J. Ghosh, R. Kumar, S. Aich, T. Macwan, D. Kumawat, K.A. Jadeja, K.M. Patel, M.B. Kalal, D.S. Varia, D.H. Sadharakiya, S.B. Bhatt, K. Sathyanarayana, B.K. Shukla, P.K. Chattopadhyay, M.N. Makwana, K.S. Shah, S. Gupta, V. Ranjan, V. Balakrishnan, C.N. Gupta, V.K. Panchal, Praveenlal E.V, B. Arambhadiya, Minsha Shah, V. Raulji, M.B. Chowdhuri, S. Banerjee, R. Manchanda, G. Shukla, K. Shah, R. Dey, Nandini Yadava, S. Patel, N. Bisai, D. Raju, P.K. Atrey, S.K. Pathak, U. Nagora, J. Raval, Y.S. Joisa, Manoj Kumar, K. Tahiliani, S.K. Jha, M.V. Gopalkrishana and A. Sen, **Nucl. Fusion 59 (2019), Number 11, 112006 (16pp)** DOI: https://doi.org/10.1088/1741-4326/ab0a9e

"Investigation of atomic and molecular processes in H_a emission through modelling of measured H_a emissivity profile using DEGAS2 in ADITYA tokamak", Ritu Dey, M.B. Chowdhuri, J. Ghosh, R. Manchanda, Nandini Yadava, N. Ramaiya, S. Banerjee, U. Nagora, P.K. Atrey, J. Raval, Y.S. Joisa, R.L. Tanna, D. Stotler and Aditya Team, **Nucl. Fusion 59 (2019), Number 7, 076005 (11pp)** DOI: https://doi.org/10.1088/1741-4326/ab0f01

"Commissioning of Electron Cyclotron Resonance Heating (ECRH) system on Tokamak ADITYA-U", B.K. Shukla, J. Patel, H. Mistry, Harshida Patel, D. Purohit, K. Parmar, Rajan Babu, J. Ghosh, R.L. Tanna, M. Kushwah, Aditya-U Team, **Fusion Engineering & Design, 146 (2019) 2083-2086** DOI: https://doi.org/10.1016/j.fusengdes.2019.03.108

"Design, Development and Operation of seven channels 100 GHz interferometer for plasma density measurement", P.K. Atrey, Dhaval Pujara, S. Mukherjee and R.L. Tanna, **IEEE Transactions on Plasma Science, Vol. 47, NO. 2, February 2019, p.g. 1316-20** DOI: 10.1109/TPS.2018.289030

"A Proposed Method for Disruption Classification in Tokamak using Convolutional Neural Network", P. Sharma, S. Jain, V. Jain, S. Ranjan, R. Manchanda, D. Raju, J. Ghosh, R.L. Tanna, The International Conf. Towards Extensible and Adaptable Methods in Computing, TEAMC 2018, 26-28 March, 2018, **book chapter: Towards Extensible and Adaptable Methods in Computing, pp.179-193 (Nov., 2018)** DOI: https://doi.org/10.1007/978-981-13-2348-5_14

"Design of Tangential X-ray Crystal Spectrometer for Aditya-U tokamak", K. Shah, M.B. Chowdhuri, G. Shukla, R. Manchanda, K.B.K. Mayya, K.A. Jadeja, N.A. Pablant, and J. Ghosh, **Review of Scientific Instruments 89, 10F115 (October-2018)** DOI: https://doi.org/10.1063/1.5039359

"Plasma rotation measurement using UV and visible spectroscopy on Aditya-U tokamak", G. Shukla, M.B. Chowdhuri, K. Shah, R. Manchanda, K.B.K. Mayya, J. Ghosh, and Aditya-U Team, **Review of Scientific Instruments 89, 10D132 (October-2018**) DOI: https://doi.org/10.1063/1.5039333

"A Study of the von Neumann Stability Analysis of a Semi-implicit Numerical Method Applied Over the Radial Impurity Transport Equation in Tokamak Plasma", Amrita Bhattacharya, Prabhat Munshi, Joydeep Ghosh, M. B. Chowdhuri, **Journal of Fusion Energy, 37, (2018) 211-237**

"Design and Development of Millimeter Wave Interferometer Circuit for Real-Time Measurement of Plasma Density", Praveen K. Atrey, Dhaval Pujara, Subroto Mukherjee, Umesh Nagora, Praveenlal Edappala, Praveena Kumari, and Rachana Rajpal, **Progress In Electromagnetics Research M 68, (2018) 1–10.**

"Recent Activities on SST-1 and ADITYA-U Tokamaks", P.K. Sharma, Yogesh Jain, K. Ambulkar, Pramod Parmar, Chetan Virani, Saifali Dalakoti, Jagabandhu Kumar, Arvind Thakur, D. Raju, J. Ghosh and SST-1 and ADITYA-U team, **Plasma and Fusion Research, Volume 13, 3502100 (2018)**

"Design of Signal Analysis Techniques for Determining the Parameters Responsible for Plasma Disruption in ADITYA Tokamak", B. Sheela Rani, N.M. Nandhitha, G. Yogalakshmi, R.L. Tanna and J. Ghosh, 9th International Conference on Computing, Communication and Networking Technologies (ICCNT), 10-12 July, 2018, IISc, Bengaluru, India. **IEEE Xplore, IAN: 18192541, (October- 2018)** DOI: https://ieeexplore.ieee.org/document/8494147

"Spectral statistical analysis of low frequency coefficients from diagnostic signals depicting MHD disruptions", T.T.M. Delsy, N.M. Nandhitha, R.L. Tanna, J. Ghosh, International Conf. on Circuit, Power and Computing Technologies (ICCPCT), 20-21 Apr., 2017, Kollam, **IEEE Xplore, INS No. 17279992, (October 2017)** DOI: **10.1109/ICCPCT.2017.8074353**

"Plasma production and preliminary results from the ADITYA Upgrade tokamak", R.L. Tanna, J. Ghosh, H. Raj, R. Kumar, S. Aich, V. Ranjan, K.A. Jadeja, K.M. Patel, S.B. Bhatt, K. Sathyanarayana, P.K. Chattopadhyay, M. Makwana, K.S. Shah, C.N. Gupta, V. Panchal, Praveenlal E.V, B. Arambhadiya, Minsha Shah, V. Raulji, M.B. Chowdhuri, S. Banerjee, R. Manchanda, D. Raju, P.K. Atrey, U. Nagora, J. Raval, Y. Joisa, K. Tahiliani, S.K. Jha, M.V. Gopalkrishana, **Plasma Sci. Technol. 20 (2018) 074002 (8pp)** DOI: https://doi.org/10.1088/2058-6272/aabb4f

"MHD Mode Bispectral Analysis from Density Fluctuations in Aditya Discharges", P.K. Atrey, Dhaval Pujara, S. Mukherjee, **Fusion Engineering and Design, Vol. 130, 89, (May-2018)** DOI: https://doi.org/10.1016/j.fusengdes.2018.03.035

"Generation and Transport of Runaway Electrons during Sawteeth Crash in ADITYA Tokamak", H. Raj, J. Ghosh, R.L. Tanna, P.K. Chattopadhyay, D.Raju, S.K. Jha, J. Raval, Y. Joisa, S. Purohit, P.K. Atrey, Y.C. Saxena, R. Pal and Aditya Team, **Nucl. Fusion 58 (2018) 076004 (9pp)** https://doi.org/10.1088/1741-4326/aabdbf

"RF Design of Passive Active Multijunction (PAM) Launcher for LHCD System of ADITYA-Upgrade Tokamak" Yogesh Jain, P.K. Sharma, Harish V. Dixit, Aviraj Jadhav, Julien Hillairet, Mar Cgoniche, Jagabandhu Kumar, **Fusion Engineering and Design, Vol. 134, 109, (September-2018)** DOI: https://doi.org/10.1016/j.fusengdes.2018.04.084

"Observation of thick toroidal filaments during the disruptive phase of Aditya tokamak plasma", S. Banerjee, N. Bisai, D. Chandra, P. Dhyani, R. Manchanda, M.B. Chowdhuri, N. Ramaiya, D. Sangwan, J. Ghosh, R. L. Tanna, P. K. Chattopadhyay, D. Raju, P. K. Atrey, Y.S. Joisa, A. Sen, P. K. Kaw and Aditya Team, **Physics of Plasmas 24, 102513 (2017)** DOI: 10.1063/1.5005818

"3D Monte-Carlo Study of Toroidally Discontinuous Limiter SOL Configurations of Aditya Tokamak", Bibhu Prasad Sahoo, Devendra Sharma, Ratneshwar Jha, and Yuhe Feng, **Physics of Plasmas, 24, 082505, (July-2017)** DOI: https://doi.org/10.1063/1.4994534

"Overview of recent experimental results from the Aditya tokamak", R.L. Tanna, J. Ghosh, P.K. Chattopadhyay, H. Raj, S. Patel, P. Dhyani, C.N. Gupta, K.A. Jadeja, K.M. Patel, S.B. Bhatt, V.K. Panchal, N.C. Patel, C. Chavda, E.V. Praveenlal, K.S. Shah, M. Makawana, S.K. Jha, M. Gopalkrishana, K. Tahiliani, D. Sangwan, D. Raju, U. Nagora, S. Pathak, P. Atrey, S. Purohit, J. Raval, Y. Joisa, C.V.S. Rao, M.B. Chowdhuri, S. Banerjee, N. Ramaiya, R. Manchanda, J. Thomas, Ajai Kumar, Kumar Ajay, P. Sharma, S.V. Kulkarni, K. Sathyanarayana, B.K. Shukla, Amita Das, R. Jha, Y.C. Saxena, A. Sen, P.K. Kaw, D. Bora and Aditya Team, **Nucl. Fusion 57 (2017) 102008 (11pp)** DOI: https://doi.org/10.1088/1741-4326/aa6452

"ADITYA upgrade vacuum vessel: Design, construction, testing, installation and operation", K.A. Jadeja, S.B. Bhatt, Kulav Rathod, K.M. Patel, V.R. Prajapati, K.S. Acharya, N.D. Patel, R.L. Tanna, M.B. Kalal, J. Ghosh, P.K. Chattopadhyay, Y.C. Saxena, A. Das and D. Bora, **Fusion Engineering and Design 124 (2017) 558-561** DOI: https://doi.org/10.1016/j.fusengdes.2017.03.148

"Investigation of neutral particle dynamics in Aditya tokamak plasma with DEGAS2 code" Ritu Dey, J. Ghosh, M.B. Chowdhuri, R. Manchanda1, S. Banerjee, N. Ramaiya, Deepti Sharma, R. Srinivasan, D.P. Stotler and Aditya Team, **Nucl. Fusion 57 (June-2017) 086003** DOI: https://doi.org/10.1088/1741-4326/aa739c

"A Fixed Frequency Reflectometer to Measure Density Fluctuations at Aditya Tokamak", P.K. Atrey, Dhaval Pujara and S. Mukherjee **Journal of Physics: Conference Series, 823, 012011, 2017**
DOI:10.1088/1742-6596/755/1/011001

"Up and Downstream Density Scale Asymmetries in Aditya Tokamak Scrape-off Layer 3D Simulations", Bibhu Prasad Sahoo, Devendra Sharma, R. Jha and Yuhe Feng **Journal of Physics: Conference Series, 836, 012016, 2017** DOI: 10.1088/1742-6596/836/1/012016

"Behavior of Non-Thermal Electrons during ECR Pre-Ionization at Aditya tokamak", Shishir Purohit, Y.S. Joisa, M.B. Chowdhuri, B.K. Shukla, J. Raval, R. Manchanda, N. Ramaiya, Umesh Nagora, P.K. Atrey, R.L. Tanna, K.A. Jadeja, S.B. Bhatt, C.N. Gupta, Ajai Kumar, J. Ghosh and Aditya Team, **Plasma and Fusion Research: Regular Articles Vol. 12, 2402002; (February-2017**) DOI: https://doi.org/10.1585/pfr.12.2402002

"An enhanced tokamak startup model", Rajiv Goswami, Jean-François Artaud, and ADITYA Team, **Physics of Plasmas 24, 012505 (2017)** DOI: https://doi.org/10.1063/1.4973599

"Automation of Aditya Tokamak Plasma Position Control DC Power Supply", B.G. Arambhadiya, Harshita Raj, R.L. Tanna, Praveenlal E.V., R. Rajpal, J. Ghosh, P. K. Chattopadhyay, M.B. Kalal and ADITYA Team, **Fusion Engineering & Design, Vol. 112, 714-717; July-2016** DOI: http://dx.doi.org/10.1016/j.fusengdes.2016.06.032

"Multi-Channel Control Circuit for Real-Time Control of Events in Aditya Tokamak", Praveenlal Edappala, Minsha Shah, R. Rajpal, R.L. Tanna, J. Ghosh, P K Chattopadhyay, R Jha and Aditya Team, **Fusion Engineering & Design, Volume 112, 678 – 682; June-2016** DOI: http://dx.doi.org/10.1016/j.fusengdes.2016.05.030

"ECRH assisted plasma experiments on Tokamaks SST-1 and ADITYA", B.K. Shukla, D. Bora, R. Jha, S. Pradhan, J.

Ghosh, C.N. Gupta, J. Patel, R. Babu, H. Patel, P. Dhorajia, R.L. Tanna et al, 26th Symposium on Fusion Engineering (SOFE), Austin, TX, USA, 31st May – 4th June, 2015 **IEEE Xplore, INS No. 16039052, (June-2016)** DOI: https://ieeexplore.ieee.org/document/7482270

"Recent high current plasma discharges operations with booster power supply assisted vertical magnetic field in aditya tokamak", C.N. Gupta, Kunal Shah, M.N. Makwana, R.L. Tanna, et al, 26th Symposium on Fusion Engineering (SOFE), Austin, TX, USA, 31st May – 4th June, 2015**, IEEE Xplore, INS No. 16038990, (June-2016)** DOI**:** https://ieexplore.ieee.org/document/16038990

"GPIB Based Instrumentation and Control System for ADITYA Thomson Scattering Diagnostic", Kiran Patel, Vishal Pillai, Neha Singh, Vishnu Chaudhary, Jinto Thomas, Ajai Kumar **Fusion Engineering and Design, Vol. 112, 860, 2016** DOI: https://doi.org/10.1016/j.fusengdes.2016.06.021

"Automation of Aditya Vacuum Control System Based on CODAC Core System", Vismaysinh D. Raulji, Harshad Pujara, Bharat Arambhadiya, K.A. Jadeja, Shailesh Bhatt, Rachana Rajpal **Fusion Engineering and Design, 112, 910, 2016** DOI: https://doi.org/10.1016/j.fusengdes.2016.05.0232

"Embedded Multi-Channel Data Acquisition System on FPGA for Aditya Tokamak" Rachana Rajpal, Hitesh Mandaliya, Jignesh Patel, Praveena Kumari, Pramila Gautam, Vismaysinh Raulji, Praveenlal Edappala, H.D Pujara, R. Jha **Fusion Engineering and Design, 112, 964, 2016** DOI: https://doi.org/10.1016/j.fusengdes.2016.03.068

"PXIe Based Data Acquisition and Control System for ECRH Systems on SST-1 and Aditya Tokamak" Jatinkumar J. Patel, B.K. Shukla, N. Rajanbabu, H. Patel, P. Dhorajiya, D. Purohit, K. Mankadiya, **Fusion Engineering and Design, 112, 919, 2016** DOI: https://doi.org/10.1016/j.fusengdes.2016.05.014

"Operation and Control of High Power Gyrotrons for ECRH Systems in SST-1 and Aditya" B.K. Shukla, D. Bora, R. Jha, Jatin Patel, Harshida Patel, Rajan Babu, Pragnesh Dhorajiya, Shefali Dalakoti, Dharmesh Purohit, **Fusion Engineering and Design, 112, 673, 2016** DOI: https://doi.org/10.1016/j.fusengdes.2016.05.0131

"Experimental Study for Comparison of H_2 and Ar–H_2 Gas Mixture Glow Discharge Wall Conditioning in ADITYA Tokamak", K.A. Jadeja, K.M. Patel, R.L. Tanna, D. Sangwan, K.S. Acharya, N.D. Patel, S.B. Bhatt, R. Manchanda, J. Ghosh and Aditya Team, **IEEE Transactions on Plasma Science, Vol. 44, No. 4, 722 (April-2016)** DOI: 10.1109/TPS.2016.2526085

"Proof-of-Concept Experiment for On-Line Laser Induced Breakdown Spectroscopy Analysis of Impurity Layer Deposited on Optical Window and Other Plasma Facing Components of Aditya Tokamak", Gulab Singh Maurya, Rohit Kumar, Ajai Kumar, and Awadhesh Kumar Rai **Review of Scientific Instruments, 86, 123112, 2015** DOI: https://doi.org/10.1063/1.4938176

"Multidirectional plasma flow measurement by Gundestrup Probe in scrape-off layer of Aditya tokamak", D. Sangwan, R. Jha and R.L. Tanna, **Physics of plasmas 22, 112501 (2015) (7pp)** DOI: 10.1063/1.4935292

"Second-Harmonic Ion Cyclotron Resonance Heating Scenarios of Aditya Tokamak Plasma" Asim Kumar Chattopadhyay, S V Kulkarni, R Srinivasan, Aditya Team **Pramana - Journal of Physics, 85, 713-721, 2015** DOI: 10.1007/s12043-014-0908-1

"Flow Structure and Shear Generation in the 3D SOL of Circular Tokamak Plasma in Aditya" Bibhu Prasad Sahoo, Devendra Sharma, Ratneshwar Jha and Yuhe Feng **Nucl. Fusion 55 063042** DOI: https://doi.org/10.1088/0029-5515/55/6/063042

"The ITPA Disruption Database", N.W. Eidietis, S.P. Gerhardt, R.S. Granetz, Y. Kawano, M. Lehnen, G. Pautasso, V. Riccardo, R.L. Tanna, A.J. Thornton and ITPA Disruption Database Participants, **Nucl. Fusion 55 (2015) 063030 (16pp)** DOI:10.1088/0029-5515/55/6/063030

"Novel Approaches for Mitigating Runaway Electrons and Plasma Disruptions in ADITYA Tokamak", R.L. Tanna, J. Ghosh, P.K. Chattopadhyay, P. Dhyani, S. Purohit, S. Joisa, C.V.S. Rao, V.K. Panchal, D. Raju, K.A. Jadeja, S.B. Bhatt, C.N. Gupta, Chhaya Chavda, S.V. Kulkarni, B.K. Shukla, Praveenlal E.V, Jayesh Raval, A. Amardas, P.K. Atrey, U. Dhobi, R. Manchanda, N. Ramaiya, N. Patel, M. B. Chowdhuri, S. K. Jha, R. Jha, A. Sen, Y. C. Saxena, D. Bora and the ADITYA Team, **Nucl. Fusion 55 (2015) 063010 (5pp)** DOI:10.1088/0029-5515/55/6/063010

"Role of Neutral Gas in Scrape-off Layer Tokamak Plasma", N. Bisai, R.Jha and P.K. Kaw, **Physics of Plasma, Volume 22, Issue 2, 022517, February -2015** DOI: https://doi.org/10.1063/1.4913429

"Plasma Diagnostics at Aditya Tokamak by Two Views Visible Light Tomography", Mayank Goswami, Prabhat Munshi, Anupam Saxena, Manoj Kumar, and Ajai Kumar **Fusion Engineering and Design, 89, 2659-2665, 2014** DOI: https://doi.org/10.1016/j.fusengdes.2014.07.003

"A Set up for Biased Electrode Experiment in ADITYA Tokamak", P. Dhyani, J. Ghosh, K. Sathyanarayana, Praveenlal EV, Pramila Gautam, Minsha Shah, R.L. Tanna, Pintu Kumar, C. Chavda, N.C. Patel, V. Panchal, C.N. Gupta, K.A. Jadeja, S.B. Bhatt, S. Kumar, D. Raju, P.K. Atrey, Y.S. Joisa, P.K. Chattopadhyay, Y.C. Saxena and ADITYA Team, **Meas. Sci. Technol. 25 (2014) 105903 (11pp)** DOI:10.1088/0957-0233/25/10/105903

"Silicon drift detector based X-ray spectroscopy diagnostic system for the study of non-thermal electrons at Aditya toakamak", S. Purohit, Y.S. Joisa, J.V. Raval, J. Ghosh, R.L. Tanna, B.K. Shukla, and S.B. Bhatt, **Review of Scientific Instruments 85, 11E419 (2014)** DOI: 10.1063/1. 4890406

"Measurement of spatial and temporal behavior of Hα emission from Aditya tokamak using a diagnostic based on a photomultiplier tube array", M. B. Chowdhuri, J. Ghosh, R. Manchanda, Ajay Kumar, S. Banerjee, N. Ramaiya, N. Virani, Aniruddh Mali, A. Amardas, P. Kumar, R.L. Tanna, C. N. Gupta, S. B. Bhatt, P.K. Chattopadhyay, **Review of Scientific Instruments 85, 11E411 (2014)** DOI: 10.1063/1.4889912

"A novel approach for mitigating disruptions using biased electrode in Aditya tokamak", P. Dhyani, J. Ghosh, P.K. Chattopadhyay, R.L. Tanna, D. Raju, S. Joisa, A. Chattopadhyay, D. Basu, N. Ramaiya, S. Kumar, K. Sathyanarayana, S.B. Bhatt, P.K. Atrey, C.N. Gupta, C.V.S. Rao, R. Jha, Y.C. Saxena and R. Pal. **Nucl. Fusion 54 (2014) 083023 (5pp)** DOI: 10.1088/0029-5515/54/8/083023

"Aditya-Swadeshi Tokamak" (In Hindi), R. Jha and Kumuduni Tahiliani **Aavishkar, 44, 32, 2014**

"Transport Driven Plasma Flows in the Scrape-Off Layer of ADITYA Tokamak in Different Orientations of Magnetic Field", Deepak Sangwan, R. Jha, Jana Brotankova, and M. V. Gopalkrishna **Physics of Plasmas, 21, 062512, 2014** DOI: https://doi.org/10.1063/1.4885108

*"CAD Modelling of ADITYA TOKOMAK"***,** Abhay S. Gorea, Nakul M. Kodarkar, J. Ghosh**, International Conf. on Design, manufacturing and Mechatronics (ICDMM)(2014) 1-4**

"ECRH Systems on Tokamaks SST-1 and Aditya", B.K. Shukla, **Fusion Science and Technology, Volume 65, Pages. 145-153, January-2014** DOI: https://doi.org/10.13182/FST13-647

*"Estimation of Effective Responsively of AXUV Bolometer in ADITYA Tokamak by Spectrally Resolved Radiation Power Measurement"***,** Kumudni Tahiliani, R. Jha, Prabhat Kumar and ADITYA Team, **Plasma and Fusion Research, Volume 8, 2402124, (November-2013)**

"Influence of Plasma Surface Interactions on tokamak start-up", Rajiv Goswami, **Phys. Plasmas 20, 082516 (August -2013)** DOI: http://dx.doi.org/10.1063/1.4818988

"Development of In Situ Laser Blow Off Cleaning Setup for ADITYA Tokamak Window", S. Sasanka Kumar, M.K. Jayaraj, Ajai Kumar, Ravi A.V. Kumar, **Fusion Science and Technology, Volume 64, Issue 1, Pages 54-62, July-2013**

"3-D simulations of plasma transport in the ring limiter scrape-off layer of tokamak Aditya", Devendra Sharma, R. Jha, Yühe Feng, Francesco Sardei, **Nucl. Materials 438 (2013) S554–S558, Vol. 438, July-2013**

"Modification of Plasma Flows with Gas Puff in the Scrape-off Layer of ADITYA Tokamak', Deepak Sangwan, R. Jha, Jana Brotankova and M. V. Gopalkrishna, **Phys. Plasmas 20, 062503 (June-2013)** DOI: http://dx.doi.org/10.1063/1.4811476

"Vacuum coupling of photo multiplier tube with monochromator for improved monitoring of VUV emission from Aditya tokamak", R. Manchanda, M.B. Chowdhuri, J. Ghosh, K.M. Patel, N. Ramaiya, S. Banerjee, Niral Chanchapara, Aniruddh Mali, Vipal Rathod, C.J. Hansalia and Vinay kumar, **Indian Journal of Pure & Applied Physics, Vol. 51, June 2013, PP. 421-425**

*"Improvement of Plasma Performance with Lithium Wall Conditioning in Aditya tokamak"***,** M. B. Chowdhuri, R. Manchanda, J. Ghosh, S. B. Bhatt, Ajai kumar, B. K. Das, K. A. Jadeja, P. A. Raijada, Manoj kumar, S. Banerjee, Nilam Ramaiya, Aniruddh Mali, Ketan M. Patel, Vinay Kumar, P. Vasu, R. Bhattacharyay, R.L.Tanna, Y. Shankara Joisa, P. K. Atrey, C.V.S. Rao, D. Chenna Reddy, P.K. Chattopadhyay, R. Jha, Y.C. Saxena and Aditya team, **Plasma Science & Technology, Vol. 15, No.2, February 2013**

"Performance Evaluation of ANN Based Plasma Position Controllers for ADITYA tokamak", J. Femila Roseline, Jignesh kumar, J. Patel, J. Govindarajan, N.M. Nandhitha, B. Sheela Rani, **Int. Jn. of Electrical and Engineering Tech. (IJEET) 4 (2013) 324-328**

"Investigation of oxygen impurity transport using $O4^+$ visible spectral line in Aditya tokamak", M.B. Chowdhuri, J. Ghosh, S. Banerjee, Ritu Dey, R. Manchanda, Vinay kumar, P. Vasu, K.M. Patel, P.K. Atrey, Y.S. Joisa, C.V.S. Rao, R.L. Tanna, D. Raju, P K Chattopadhyay, R Jha, C.N. Gupta, S.B. Bhatt, Y.C. Saxena and the Aditya Team, **Nucl. Fusion 53 (February-2013) 023006 (8pp)** DOI: 10.1088/0029-5515/53/2/023006

"Core-ion temperature measurement of the ADITYA tokamak using passive charge exchange neutral particle energy analyzer", Santosh P. Pandya, Kumar Ajay, Priyanka Mishra, Rajani D. Dhingra, and J. Govindarajan, **Review of Sci. Instrum. Vol. 84, 023503 (February-2013)** DOI: https://doi.org/10.1063/1.4791998

"Analysis of Limiters for ADITYA Tokamak", Nakul M. Kodarkar, Abhay S. Gore, S.B. Bhatt, M. K. Rodge, **International Journal of Mechanical and Industrial Engineering (IJMIE), ISSN No. 2231 –6477, Vol-1, Issue-4, 2012, 34-37**

"Influence of Wall Conditioning on Aditya Plasma Discharges", R.L.Tanna, K A Jadeja, S B Bhatt, P S Bawankar, C N Gupta, Y S Joisa, P K Atrey, R Manchanda, Nilam Ramaiya, J Ghosh, D Raju, P K Chattopadhyay, R Jha and the ADITYA team, **J. of Physics, Conference Series 390 012044 (November-2012)**

"Study of Hydrogen Pumping through Condensed Argon in Cryogenic pump", K. A. Jadeja and S B Bhatt, **J. of Physics, Conference Series 390 012028 (November-2012)**

"Programmable Pulse Generator for ADITYA Gas Puffing System", Narendra Patel, Chhaya Chavda, S.B. Bhatt, P.K. Chattopadhyay, Y.C. Saxena, **Journal of Physics, Conference Series 390 012012 (November-2012)** DOI: http://iopscience.iop.org/1742-6596/390/1/012012

"FPGA Based Fuzzy Logic Controller for Plasma Position Control in ADITYA Tokamak", Pooja Suratia, Jigneshkumar Patel, Rachana Rajpal, Sorum Kotia, J. Govindarajan, **Fusion Eng. & Design, 87, 1866-1871, November-2012**

"Plasma flows in the scrape-off layer of ADITYA tokamak", D. Sangwan, R. Jha, J. Brotankova and M. V. Gopalkrishna, **Physics of Plasmas, Vol. 19, 092507 (September-2012)**

"Development of Infrared Imaging Video Bolometer for the ADITYA Tokamak", Santosh P. Pandya, Shwetang N. Pandya, Zubin Shaikh, Shamsuddin Shaikh, J. Govindarajan and ADITYA Team, **Plasma & Fusion Research, Vol. 7, 2402089 (July-2012)**

"Different Types of Lithium Coating in Tokamak ADITYA" S.B. Bhatt, A. Kumar, B.K. Das, P. A. Raijada , M. Kumar, K. A. Jadeja, **IEEE Transactions on Plasma Science, Vol. 40 , Issue: 6 , June 2012, Pages 1773 – 1777**

"Scrape-Off Layer Tokamak Plasma Turbulence", N. Bisai, R. Singh and P.K. Kaw, **Physics of Plasma, Volume 19, Issue 5, 052509, May-2012**

"Direct Electron Heating Experiment on the Aditya Tokamak Using Fast Waves in the Ion Cyclotron Resonance Frequency Range", Kishore Mishra, S V Kulkarni, D Rathi, Atul D Varia, H M Jadav, K M Parmar, B R Kadia, R Joshi, Y S S Srinivas, Raj Singh, Sunil Kumar, S Dani, A Gayatri, R A Yogi, Singh Manoj, Y S Joisa, C V S Rao, Sameer Kumar, R Jha, R Manchanda, J Ghosh, P K Atrey, S B Bhatt, C N Gupta, P K Chattopadhyay, A K Chattopadhyay, R Srinivasan, Dhiraj Bora, P K Kaw and Aditya Team, **Plasma Physics and Controlled Fusion, 53, 095011, 2011**

"42GHz 0.5MW ECRH system for Tokamaks SST-1 and Aditya", B.K. Shukla, R. Goswami, R. Babu, J. Patel, P.K. Chattopadhyay, R. Srinivasan, H. Patel, P. Dhorajia IEEE/NPSS 24th Symposium on Fusion Engineering, Chicago, 6052321, 26-30 June 2011 DOI: 10.1109/SOFE.2011.6052321

"Direct Electron Heating Observed by Fast Waves in ICRF Range on a Low-Density Low Temperature Tokamak ADITYA", K. Mishra, S. Kulkarni, D. Rathi, A. Varia, H. Jadav, K. Parmar, B. Kadia, R. Joshi, Y. Srinivas, R. Singh, S. Kumar, S. Dani, A. Gayatri, R. Yogi, M. Singh, Y. Joisa, C. Rao, S. Kumar, R. Jha, R. Manchanda, J. Ghosh, P. Atrey, S. Bhatt, C. Gupta, P.K. Chattopadhyay, A. Chattopadhyay, R. Srinivasan, D. Bora, P. Kaw, and Aditya Team, **AIP Conference Proceedings 1406, 257 (2011)** DOI: https://doi.org/10.1063/1.3664972

"Diamagnetic flux measurement in Aditya tokamak", S.K. Jha, R. Jha, Praveenlal E.V., C.J. Hansaliya, M.V. Gopalkrishna, S.V. Kulkarni, K.M. Mishra, **Review of Scientific Instruments 81, 123505 (December- 2010)** DOI: https://doi.org/10.1063/1.3514092

"Observations of H_α emission profiles in Aditya tokamak", Santanu Banerjee, J. Ghosh, R. Manchanda, R. Dey, N.

Ramasubramanian, M. B. Chowdhuri, Ketan M. Patel, Vinay Kumar, P. Vasu, P. K. Chattopadhyay, P.K. Atrey and Aditya Team, **J. Plasma Fusion Res. SERIES 9 29-32 (2010)**

"Calibration of a VUV spectrograph by Collisional-Radiative modeling of a discharge plasma", Ram Prakash, Jalaj Jain, Vinay Kumar, R. Manchanda, Bishu Agarwal, M. B. Chowdhari, Santanu Banerjee and P. Vasu, **J. Phys. B: At. Mol. Opt. Phys. 43 144012 (2010)**

"Runaway-loss induced negative and positive loop voltage spikes in the Aditya Tokamak", B.S. Paradkar, J. Ghosh, P.K. Chattopadhyay, R.L. Tanna, D. Raju, S.B. Bhatt, C.V.S Rao, Y.S. Joisa, S. Banerjee, R.Manchanda, C.N. Gupta, Y.C. Saxena and Aditya Team, **Physics of Plasma 17, 092504 (2010)** DOI: 10.1063/1.3474949

"Drift-Alfven waves induced optical emission fluctuations in Aditya tokamak", R. Manchanda, J. Ghosh, P.K. Chattopadhyay, M.B. Chowdhuri, Santanu Banerjee, N. Ramasubramanian, Ketan M. Patel, Vinay kumar, P. Vasu, R.L. Tanna, B. Paradkar, C.N. Gupta, S.B. Bhatt, D. Raju, R.Jha, P.K. Atrey, S. Joisa, C.V.S. Rao, Y.C. Saxena and Aditya Team, **Physics of Plasma 17, 072515 (2010)** DOI: 10.1063/1.3461165

"Investigation of gas puff induced fluctuation suppression in ADITYA tokamak", R. Jha, A. Sen, P.K. Kaw, P.K. Atrey, S.B. Bhatt, N. Bisai, K. Tahiliani, R.L. Tanna and the ADITYA Team, **Plasma Phys. Control Fusion 51 (2009) 095010 17pp** DOI: 10.1088/0741-3335/51/9/095010

"Space- and time-resolved visible-emission spectroscopy of Aditya-tokamak discharges using multi-track spectrometer", Santanu Banerjee, Vinay Kumar, M B Chowdhuri, J Ghosh, R Manchanda, Ketan M Patel and P Vasu, ***Meas. Sci. Technol.*** **19 (2008) 045603 (7pp)**

"Measurement of Ion Pfirsch-Schluter flows in the edge region of the ADITYA Tokamak", J. Ghosh, V. Kumar, P. Vasu, S. Banerjee, R. Manchanda, B. Paradkar, R.L. Tanna, P.K. Chattopadhyay, R. Jha, D. Raju, Y.C. Saxena & ADITYA Team, ***17th IAEA Technical Meeting on Research using small fusion devices, Lisbon*****, Oct 22-24, 2007**

"Analysis of disruptive instabilities in Aditya Tokamak discharges", Asim K. Chattopadhyay, Arun Anand, C.V.S. Rao, S. Joisa and Aditya team, **Ind. Jn. Pure & Applied Physics 44 (2006) 826-837**

"Gas puffing by molecular beam injection in Aditya tokamak", S.B. Bhatt, Ajai Kumar, K.P. Subramanian, P.K. Atrey, Aditya Team, **Fusion Engineering and Design 75–79 (2005) 655–661**

"Ion cyclotron resonance heating system on Aditya", D Bora, Sunil Kumar, Raj Singh, S V Kulkarni, A Mukherjee, J P Singh, Raghuraj Singh, S Dani, A Patel, Sai Kumar, V George, Yss Srinivas, P Khilar, M Kushwah, P Shah, H M Jadav, Rajnish Kumar, S Gangopadhyay, H Machhar, B Kadia, K Parmar, A Bhardwaj, Suresh Adav, D Rathi and D S Bhattacharya, **Sadhana, Vol. 30 (2005) 21–46**

"Modelling of Ohmic discharges in ADITYA tokamak using the Tokamak Simulation Code", I Bandyopadhyay, S M Ahmed, P K Atrey, S B Bhatt, R Bhattacharya, M B Chowdhuri, S P Deshpande, C N Gupta, R Jha, Y Shankar Joisa, Vinay Kumar, R Manchanda, D Raju, C V S Rao, P Vasu and the ADITYA Team, **Plasma Phys. Control. Fusion 46 (2004) 1443–1453**

"Plasma current and position feedback control in ADITYA Tokamak", V. Balakrishnan, C.N. Gupta, R.K. Sinha, ADITYA Team, **Fusion Engineering and Design 66-68 (2003) 809-813**

"Evidence of Le´vy stable process in tokamak edge turbulence", R. Jha and P. K. Kaw, D. R. Kulkarni and J. C. Parikh, ADITYA Team, **Physics of Plasmas 10 (2003) 699-704**

"SST and ADITYA Tokamak Research in India", Dhiraj Bora, ADITYA Team & SST-1 Team, **2002 Braz. J. Phys. 32 193**

"Prediction of density limit disruption boundaries from diagnostic signals using neural networks", A.Sengupta, P. Ranjan, **Nuclear Fusion 41 (2001) 487**

"Forecasting disruptions in the ADITYA tokamak using neural networks", A. Sengupta, P. Ranjan, **Nuclear Fusion, 40 (2000) 1993**

"Internal magnetic field measurement in tokamak plasmas using a Zeeman polarimeter", M Jagadeeshwari, J Govindarajan, **Pramana - J Phys 55 (2000) 751**

"Electron temperature (Te) measurements by Thomson scattering system", R Rajesh, B Ramesh Kumar, S K Varshney, Manoj kumar, Chhaya Chavda, Aruna Thakkar, N C Patel, Ajai Kumar and ADITYA Team, **Pramana – Jn. Of Physics 55 (2000) 733**

"Mirnov Coil data analysis for tokamak ADITYA", D. Raju, R. Jha, P.K. Kaw, S.K. Mattoo, Y.C. Saxena & ADITYA Team, **Pramana – Jn. Of Physics 55 (2000) 727**

"Observation of Vortex-like coherent structures in the edge plasma of ADITYA tokamak", Biju K. Joseph, R. Jha, P.K. Kaw, S.K. Mattoo, C.V.S. Rao, Y.C. Saxena and the ADITYA Team, **Physics of Plasmas 4 (1997) 4292.**

"Structures, wavelet and intermittency in tokamak edge turbulence", R. Jha, S.K. Mattoo and Y.C. Saxena, **Physics of Plasmas 4 (1997) 2982.**

"Super heterodyne radiometer to measure electron temperature profile in Aditya tokamak", Neelima Chaube, K.K. Jain, **Fusion Engineering and Design 34-35 (1997) 473 476**

"Wavelet Analysis of ADITYA edge turbulence: evidence of nonlinear interaction", R. Jha and Y.C. Saxena, **Physics of Plasmas 3 (1996) 2979.**

"ADITYA Tokamak: Status and initial results", Y.C. Saxena, **Reviews on Plasma Physics** (Ed. M.S. Sodha and K.P. Maheswari); New Age International (P) Limited, New Delhi (1996) 207-227.

"Glow Discharge wall conditioning of tokamak ADITYA", H.A. Pathak and Y.C. Saxena, **Journal of Nuclear Materials, 220-222, (1995), 708.**

"Recent developments ADITYA Operations", P.K. Atrey, V. Balakrishnan, S.B. Bhatt, D. Bora, B.N. Buch, Chaya Chavda, C.N. Gupta, C.J. Hansaliya, K.K. Jain, R. Jha, P.I. John, P.K. Kaw, A. Kumar, V. Kumar, S.K. Mattoo, C.V.S. Rao, H.A. Pathak, K. Sathyanarayana, Y.C. Saxena, G.C. Sethia, A. Varadharajulu, P. Vasu, **Research Using small tokamaks (IAEA Technical Committee Meeting, Ahmedabad) (1995) 73-79**

"Pressure measurements using Bayard-Alpert gauge in presence of magnetic field", S.B. Bhatt, H.A. Pathak, K.V.A.N.P.S. Kumar and Y.C. Saxena. **Proc. International Conference on Vacuum Science and Technology and SRC Vacuum Systems, (Ed. N. Venkataramani & A.K. Sinha; Centre for Advanced Technology, Indore), 3 (1995) 687**

"Characterization of Coherent structures in Tokamak edge region", S. Benkadda, T. Dudok de Wit, A. Vega, A. Sen, ASDEX team and X. Garbit, **Phy. Rev. Letts. 73 (1994) 3403**

"Studies of Intermittency and edge turbulence in ADITYA", R. Jha, Biju K. Joseph, R. Kalra, P.K. Kaw, S.K. Mattoo, D. Raju, C.V.S. Rao, Y.C. Saxena, A. Sen and ADITYA Team, **Proc. 15th. IAEA Conference on Plasma Physics & Controlled Nuclear Fusion Research, (Seville, Spain, Sept. 26, Oct. 1, 1994), IAEA, Vienna, 1 (1995) 583.**

"Observation of the spatial structures in tokamak ADITYA" K.J. Biju, R. Jha, P.K. Kaw, S.K. Mattoo, C.V.S. Rao, Y.C. Saxena and ADITYA Team, **Proc. 1993 IAEA Technical Committee Meeting on Research Using Small Tokamaks, 25-26 Oct. 1993, Serra Negra, SP. Brazil (eds. P.H. Sakanaka, C.A. de Azevedo, A.S. de Assis), (1993) 21.**

"Particle transport and magnetic fluctuations in Tokamak Edge plasma", D. Raju, R. Jha, P.K. Kaw, S.K. Mattoo, C.V.S. Rao, Y.C. Saxena and ADITYA Team, **Proc. 1993 IAEA Technical Committee Meeting on Research Using Small Tokamaks, 25-26 Oct. 1993, Serra Negra, SP. Brazil (eds. P.H. Sakanaka, C.A. de Azevedo, A.S. de Assis), (1993) 20.**

"Fluctuation induced inward particle transport in Tokamak SOL Plasma", R. Jha, P.K. Kaw, S.K. Mattoo, C.V.S. Rao, Y.C. Saxena, R. Singh and ADITYA Team, **Nucl. Fusion, 33(8), (1993) 1201.**

"Design of multistage 250 kJ Capacitor bank for Ohmic coils of Tokamak ADITYA", K. Sathyanarayana, Y.C. Saxena, P.I. John, H.D. Pujara and K.K. Jain, **Rev. Sc. Instruments 64, (1993) 1263.**

"Fluctuation induced inward particle transport in Tokamak SOL Plasma", R. Jha, P.K. Kaw, S.K. Mattoo, C.V.S. Rao, Y.C. Saxena, R.S. Singh and ADITYA Team, **Proc. IAEA Technical Committee Meeting on Research Using Small Tokamaks, Wurzburg, Germany, Sep. 28-29, 1992.**

"Intermittency in Tokamak Edge Turbulence", R. Jha, P.K. Kaw, S.K. Mattoo, C.V.S. Rao, Y.C. Saxena and ADITYA team, **IAEA Conference on Plasma Physics & Controlled Nuclear Fusion Research, (Wurzburg, Germany 30th Sep. - 7 Oct. 1992), IAEA-CN-56/A-3-9 (1992) 54.**

"Nature of current termination in low-q discharges in ADITYA", P.K. Atrey, S.B. Bhatt, D. Bora, B.N. Buch, C.N. Gupta, K.K. Jain, R. Jha, P.I. John, P.K. Kaw, A. Kumar, V. Kumar, S.K. Mattoo, C. Natarajan, H.A. Pathak, H.R. Prabhakara, H.D. Pujara, D.C. Reddy, C.V.S. Rao, K. Sathyanarayana, Y.C. Saxena, G.C. Sethia, A. Varadharajulu, P. Vasu and N. Venkatramani, **Ind. Jn. Physics, 66B, (1992), 499.**

"Breakdown experiments on ADITYA Tokamak", P.K. Atrey, S.B. Bhatt, D. Bora, B.N. Buch, C.N. Gupta, K.K. Jain, R. Jha, P.I. John, P.K. Kaw, A. Kumar, V. Kumar, S.K. Mattoo, C. Natarajan, H.A. Pathak, H.R. Prabhakara, H.D. Pujara, D.C. Reddy, C.V.S. Rao, K. Sathyanarayana, Y.C. Saxena, G.C. Sethia, A. Varadharajulu, P. Vasu and N. Venkatramani, ***Ind. Jn. Physics*, 66B, (1992), 489.**

"Measurement of chord averaged density in ADITYA using 100 GHz and 136 GHz interferometer", P.K. Atrey, S.B. Bhatt, D. Bora, B.N. Buch, C.N. Gupta, K.K. Jain, R. Jha, P.I. John, P.K. Kaw, A. Kumar, V. Kumar, S.K. Mattoo, C. Natarajan, H.A. Pathak, H.R. Prabhakara, H.D. Pujara, D.C. Reddy, C.V.S. Rao, K. Sathyanarayana, Y.C. Saxena, G.C. Sethia, A. Varadharajulu, P. Vasu and N. Venkatramani, **Ind. Jn. Physics, 66B, (1992), 481.**

"Convective losses preceding formation of rotational transform", P.K. Atrey, S.B. Bhatt, D. Bora, B.N. Buch, C.N. Gupta, K.K. Jain, R. Jha, P.I. John, P.K. Kaw, A. Kumar, V. Kumar, S.K. Mattoo, C. Natarajan, H.A. Pathak, H.R. Prabhakara, H.D. Pujara, D.C. Reddy, C.V.S. Rao, K. Sathyanarayana, Y.C. Saxena, G.C. Sethia, A. Varadharajulu, P. Vasu and N. Venkatramani, **Ind. Jn. Physics, 66B, (1992), 473.**

"Fluctuations in Tokamak edge plasma", Y.C. Saxena, **Ind. Jn. Physics, 66B, (1992), 457.**

"Intermittency in Tokamak Edge turbulence", R. Jha, P.K. Kaw, S.K. Mattoo, C.V.S. Rao, Y.C. Saxena and ADITYA Team, **Phys. Rev. Letts. 69 (1992) 1375.**

"ADITYA: Initial results and Status of Edge control experiments", P.K. Atrey, S.B. Bhatt, D. Bora, B.N. Buch, J. Govindrajan, C.N. Gupta, K.K. Jain, R. Jha, P.I. John, K. Kasturi, A. Khare, P.K. Kaw, A. Kumar, V. Kumar, S.K. Mattoo, C. Natarajan, R. Pal, H.A. Pathak, H.R. Prabhakara, H.D. Pujara, V.N. Rai, D.C. Reddy, C.V.S. Rao, M.V.V.S. Rao, K. Sathyanarayana, Y.C. Saxena, G.C. Sethia, A.V. Varadharajulu, P. Vasu and N. Venkatramani, **1990 IAEA TCM on research using small tokamaks, (Arlington, VA, USA, September, 27-28, 1990) IAEA-TECDOC-604 (1991) 103.**

"ADITYA: The first Indian Tokamak", S.B. Bhatt, D. Bora, B.N. Buch, C.N. Gupta, K.K. Jain, R. Jha, P.I. John, P.K. Kaw, Kumar, S.K. Mattoo, C. Natarajan, R. Pal, H.A. Pathak, H.R. Prabhakara, H.D. Pujara, V.N. Rai, C.V.S. Rao, M.V.V.S. Rao, K. Sathyanarayana, Y.C. Saxena, G.C. Sethia, A.V. Varadharajulu, P. Vasu and N. Venkatramani, **Ind. Jn. Pure & Applied Phys. 27 (1989) 710.**

Industry support for ADITYA	
Subsystems/ Components	**Fabrication By**
UHV Vacuum Vessel	M/S Larsen & Toubro, Mumbai
TF Coil Machining	M/S Lakshmi Vijay Brass & Iron Works, Ahmedabad
TF Coil Insulation & Consolidation; Poloidal coils	Coils & Insulation Division M/S Bharat Heavy Electrical Limited, Bhopal
Supporting Structure	M/S Godrej Industries, Mumbai
Buckling Cylinder	M/S Dakle, Vapi
Water Cooling System	M/S Blue Star, Ahmedabad
132 kV Sub-station	M/S Asia Brown Boveri M/S Siemens
Aditya Pulse Power System	M/S NGEF, Bangalore, in collaboration with M/S AEG, Germany
Bus Bars	M/S Hindustan Brown Boveri, Vadodara
Capacitor Banks	In-house
TF DC power Supply	M/S Electrotherm, Ahmedabad
ADACS	In-house
PLC	M/S Asia Brown Boveri
Pumping system, Vacuum Seals, Gas feed system etc.	In-house
Pumping Ducts	Variety Engineers, Vadodara
Plasma Diagnostics	In-house
Assembly (Aditya Machine)	M/S Teknow Consultants & Engineers Pvt. Ltd., New Delhi under supervision of IPR
Dis-Assembly and Re-Assembly (Aditya-U Machine)	Shell-N-Tube, Pune
UHV Vacuum Vessel (Aditya-U)	M/S Godrej Industries, Mumbai
CTC conductors for Diverter Coils	M/S Shree Cables and Conductors Pvt. Ltd., Bhopal

Conceptual Design: In-house

Engineering design and fabrication supervision with M/S Tata Consultant Engineers, Mumbai as consultants.

Special advices from Scientist and Engineers from BARC, Mumbai, VSSC, Trivandrum and SAC, Ahmedabad during the design and fabrication.

Allied Publishers Group

Welcomes all Delegates

We are specialized in helping Libraries and Organisations of all types to obtain and manage Books, Journals including e-Journals & e-Books and other Offline and Online Products & International Standards.

We represent more than 100 foreign and Indian publishers like John Wiley, Taylor & Francis, Elsevier, Springer, McGraw-Hill, Macmillan, Sage, OUP, CUP, Pearson, IMF, Tata McGraw-Hill, Pearson Education, PHI Learning, Cengage Learning, ASME, ASTM, ASM, NTIS, SAE, DIN, IEC, API, NACE etc.

We also represent eResources from Elsevier, Springer, ProQuest, I.H.S., KeyToMetals, Wolters Kluwer, BMJ, OUP, Nature, Wiley, Sage, Pearson ThinkTank, TMH Express Library, IMF, Cengage Gale etc.

We publish books from K12 all the way till research level publications.

Allied Publishers Group

1st Floor Dubash House, 15 J.N. Heredia Marg, Ballard Estate,
Mumbai – 400 001, INDIA
Tel # (022) 42126969 / 31, Fax # +91 (22) 22617928
Books Email ID – mumbai.books@alliedpublishers.com
Journals Email ID – mumbai.journals@alliedpublishers.com
Electronic Resources Email ID – ageorge@alliedpublishers.com

www.alliedpublishers.com

IWI CRYOGENIC VAPORIZATION SYSTEMS (INDIA) PVT. LTD.

CRYOGAS INDUSTRIES

SHI Sumitomo Heavy Industries, Ltd. Sumitomo Cryocoolers

Products

(1) 4K CCR
(2) 10K CCR
(3) Portable Helium Liquefier
(4) Portable Nitrogen Liquefier
(5) Gas Cooling Systems
(6) Ultra High Vacuum Systems
(7) Cryogen Free Superconducting Systems
(8) Cryogenic Storage Tanks
(9) Cryogenic Transport Tanks
(10) LH 2 , LOX , LN2 Transfer Line for SPACE APPLICATIONS

Helium Liquefaction Plant

Cold Head

Compressor

Cryostat

CRYOCOOLERS :

(1) SRDK Series Cryocoolers
(2) SRP Pules Tube
(3) GM - JT Series

COMPRESSORS :

(1) Selection to fit to world voltages
(2) Selection from water-cooled & air-cooled
(3) Selection of air-cooled compressor between indoor-use & outdoor-use

Multiple SIVL installed at IPR- for TOKAMAK in 2012

Helium transfer SIVL

Hexane separation system

Regd. Office :
A-36, Ghanshyam Nagar Society-2,
GIDC Road, Manjalpur,
Vadodara - 390 011. Gujarat, INDIA.

Contact :
Tele. : +91 265 2662236 / 2662288
Fax : +91 265 2662047

Mr. Amrish Patel (M) : +91 98241 08734
E-mail : amrish-iwi@cryogas-equipment.com

Suyog Patwardhan (M) : +91 99711 44535
E-mail : scientific@cryogas-equipment.com

Website : www.cryogasindia.com / www.shicryogenics.com

Magnewin

Capacitors & Power Quality Solution

Enhance your Power Quality with Precision & Wide range of Magnewin Capacitors

Product Range :

- APFC Panels
- Low Voltage Shunt Capacitors
- Medium & High Voltage Shunt Capacitors
- Medium Frequency Water Cooled Capacitors
- Medium & High Voltage Surge Capacitors
- Energy Storage & Pulse Discharge Capacitors
- Capacitor Voltage Divider
- Harmonic Filters

All Capacitors comply to latest international standards.

Engineering Services :

- Harmonics Measurement, Analysis and Mitigation.
- Turnkey Projects / Consultancy in Reactive Power Compensation Engineering.

Magnewin

Magnewin Energy Pvt. Ltd.

K-2, M.I.D.C., Kupwad - 416 436,
Dist : Sangli, Maharashtra, India.

- Tel : +91 233 2645641 / 2645041
- E-mail : marketing@magnewin.com

Since 1994

www.magnewinenergy.com

An ISO 9001:2015 Certified Company

With Best Compliments From:

MICROCON

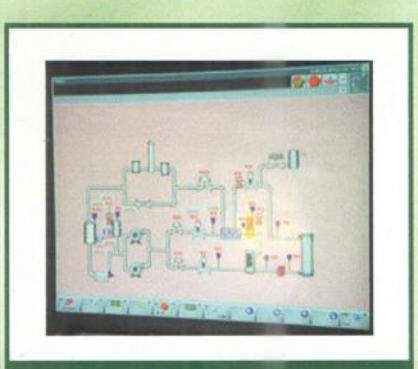
Automation & Process Control

Pro-face by Schneider Electric

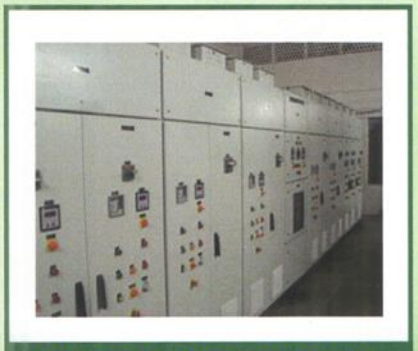
Eurotherm by Schneider Electric

Wonderware® by AVEVA™

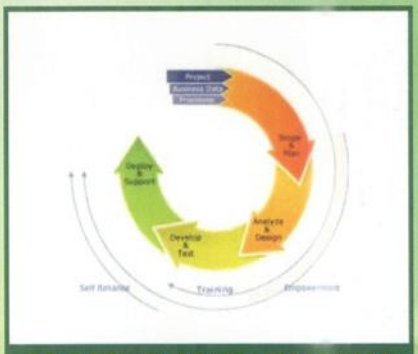
PRODUCTS



SOFTWARE

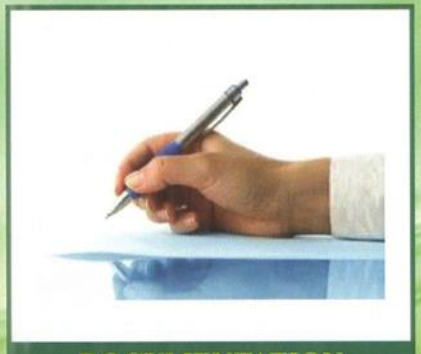


SYSTEM INTEGRATION



PROJECT MANAGEMENT

TRAINING



DOCUMENTATION

F-16/17, SHAILESH INDL. ESTATE, SATIVALI ROAD,
VASAI (EAST), DIST - PALGHAR, PIN - 401 208

E-MAIL :info@microcon.co.in | URL : www.microcon.co.in

Optimized Solutions Limited

A leading test, measurement and automation company With an extensive experience of over 15 years and multiple fortune 500 companies and multiple govt agencies as our clients.Our team of 80+ expert engineers and a combined man year experience of over 200, we provide state of art solutions to our clients across domains using flexible, modular, and scalable platforms, including IIOT.

ISO 9001:2015 Certified

15 YEARS of strong relationships

FORTUNE 500 Several FORTUNE 500 Clients

80 Engineers Expert Team

Dedicated R&D

DEFENSE

AEROSPACE

MANUFACTURING

AUTOMOTIVE

R&D

OUR SALIENT SOLUTIONS

High Power Microwave Test

Our Solution was an extensive application software that can perform multichannel test, scalable software to add new instruments functionality

Payload Control Test

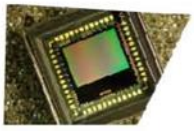
Automated Testing for Payload Controller Circuit Board. Data acquisition and Logging system

SAT-NAV Signal Monitoring

Signal Monitoring and testing for Satellite Navigation system, with around the clock monitoring

RF Up-Down Converter

Development of a custom module to help in controlling the parameters of acceleration at a particle accelerator



Detector Characterization

Design, Development, and Production of Front-end electronics & Processing electronics

High Speed Serializer-Deserializer Module

Customized module with High Speed Communication - Converting serial data into the parallel data, data rate up to 5.4Gbps

business@optimized.solutions | www.optimized.solutions

B-505, The First, Vastrapur, Ahmedabad-380015- INDIA

Tektronix · National Instruments Gold Alliance Partner · FLUKE · Schneider Electric · FLIR · KEITHLEY A Tektronix Company · MAC-PANEL Interconnect Solutions & Services

State Bank of India is among the largest retail banks in the world

SBI

#1 Largest Bank in India (Balance Sheet Size, Branches)	**423** Mn+ customer base	**USD 550** Bn+ business size	SBI Online is India's most and the World's 5th most visited banking site
80% transactions on Anytime/ Digital channels	**32.7** Mn+ Internet banking users	**59,263** Pan-India ATMs	**85.7** Mn+ Financial Inclusion accounts
24.5 Mn+ FI accounts opened during the year	**52,340 +** Customer Service Points under Business Correspondent model		

ATOS

ATOSCOPE

ANDOR
an Oxford Instruments company

Back illuminated sCMOS camera: 95% QE
-45^{0}C cooled: highest available sensitivity
4.2 megapixel /32 mm sensor

BENTHAM

Solar cell QE measurement, photobiological safety, light/display characterisation & spectroradiometers

Stinger Cold Edge

Customised cooling setups
For temp < 4.2 K with nm level vibrations

FLIR

Cooled & Uncooled IR cameras
Portable and fixed cameras

Sacher Lasertechnik

Tunable Diode Lasers – Littrow & Littman
External & Vertical Cavity Surface Emitting
Tera Hertz & Quantum Cascade Lasers

McPHERSON

VUV High Resolution Spectrometers

mcq instruments

Precision Gas Mixers
Mix 2-6 gases with precise stoichiometric ratios without usage of multiple MFCs

Montfort Laser GmbH
Uniquely Compact Pulsed Lasers

Compact Pulsed Laser Sources
Femtosecond, Picosecond & Nanosecond

ATOS Instruments Marketing Services

ATOSCOPE Instruments Pvt. Ltd.

www.atosindia.com

atos@atosindia.com

ADITYA ⟹ ADITYA UPGRADE TOKAMAK