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Report On The 21st National Symposium On Plasma Science & Technology (Plasma-2006)

Prof. R. P. Dahiya, MNIT, Jaipur

The 21st National Symposium on Plasma Science and Technology was organized jointly by Malaviya National Institute of Technology (MNIT) Jaipur and Plasma Science Society of India during December 19-22, 2006 at MNIT, Jaipur. Prof. P.K. Kaw, Director, Institute for Plasma Research Gandhinagar and Chairman of National Advisory Committee inaugurated the symposium on Dec. 19, 2006. Prof. R.P. Dahiya, Director Malaviya National Institute of Technology (MNIT), Jaipur presided over the function. In the inaugural function Prof. R.P. Dahiya gave an overview of the symposium. He said that it was a matter of great pride for MNIT that such a mega event is being organized at this Institute. Prof. P.K. Kaw delivered keynote address on the 'International Thermonuclear Experimental Reactor (ITER)', which was also the theme of the symposium. The ITER is a joint international research and development project that aims to demonstrate the scientific and technical feasibility of fusion power. The partners in the ITER project are European Union, Japan, the People's Republic of China, India, the Republic of Korea, the Russian Federation and the USA. The ITER will be constructed in Europe at Cadarache in the south of France. India is full partner of the project and will be contributing 10% of the project cost amounting to Rupees 2500 Crores worth of services and equipments. Prof. Kaw gave an overview of the research work envisaged under ITER project and he also highlighted the status of fusion research in India.

In the Symposium nearly 230 research papers were contributed in various areas of Plasma Science and Technology by more than 200 delegates from various parts of the country and abroad. There were ten technical sessions comprising of plenary and invited talks, oral and poster presentations which covered latest research and development activities. The presentations covered wide spectrum of research areas such as: Basic Plasma Physics, Nuclear Fusion and Technology, Plasma Diagnostics, Space & Astrophysical Plasmas, Exotic Plasmas, Laser Plasma Interaction, Plasma Processing, Simulation and Modeling of Plasma, etc. There were two special sessions, one on ITER and other on Fusion Physics and Technology.

A special session on Buti Young Scientist Award was also organized. The Buti Foundation has instituted two awards, each of Rs. 5000/-, for quality work by young researchers. In addition, two other awards, each of Rs. 5000/- were given for the best poster presentation. These awards were given for the first time at the initiative taken by Prof. R.P. Dahiya, Director MNIT, Jaipur and were sponsored by the organisers.

The PSSI General body meeting was held on Dec. 19, 2006 and Prof. R.P. Dahiya, Director MNIT Jaipur, was unanimously elected President of the PSSI.

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Prof. P K Kaw delivering the inagural speech.

The returning officers Dr. C.V.S. Rao and Mr. C.J. Hansalia announced the names of the following members elected for the new Executive Committee:

President – Prof. R.P. Dahiya (MNIT, Jaipur); Vice President – Dr. Amita Das (IPR, Gandhinagar); Secretary – Mr. P.K. Atrey (IPR Gandhinagar); Treasurer – Ms. Ranjana Manchanda (IPR Gandhinagar); Councilors – Prof. B. Bujarbarua (CPP, Guwahati); Prof. T.S. Gill (GNDU, Amritsar); Dr. A.K. Singh (Bundelkhand University, Jhansi); Dr. Mridul Bose (Jadavpur University, Kolkatta); Prof. R.P. Sharma (IIT, Delhi); Prof. V. Selvarajan (Bharthiar University, Coimbatore) and Dr. V.K. Mago (BARC, Mumbai). The symposium concluded in the evening of Dec. 22, 2006. Dr. K.C. Swami and Prof. Upender Pandel from MNIT Jaipur, were the Convener and Co-convener of the symposium respectively.


A view of the podium during the inauguration of Plasma-2006


A view of the audience during the Plasma-2006

An ode to ITER

In the rocky wilderness of Cadarache
wizards from seven lands will converge
To build a great temple to Prometheus
with a replica of sun, bound in a torus

Here we remember the lifetimes spent
in incessant search hoping to invent
methods and models and designs perfect
of the temple that would one day be built

Pinches, mirrors, torii, traps so diverse;
pellets of ice to be lit by lasers;
fusion in bubbles and alchemist's jars
chasing the dreams that remind you of stars

Remember too then the furious fights
on selecting the most auspicious site
and the rules, protocols, none too simple
for tending the sacred fire in the temple

Here we will spin the magnetic web
and hold the plasma as storms rise and ebb;
lighter than mist and purer than pure
hotter than sun for the nuclear fire

Centuries hence new myths will go forth
of how man brought the sun to the earth
and how Prometheus was finally freed
not by the gods but by human spirit.

Prof. P. I. John

Ahmedabad 13 Dec 2006

The symposium was sponsored by various agencies including IPR, PSSI, TEQIP (MNIT, Jaipur), AICTE, DST, BRNS, ISRO, CSIR and SINP. Several companies/suppliers also gave financial support for the Symposium.

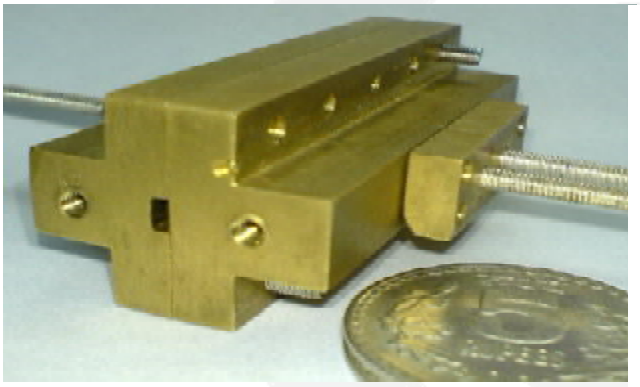
Design, Fabrication & Testing of Band-Stop Notch Filter At 82.6 GHz For ECE Radiometer

Hitesh B Pandya
Institute For Plasma Research, Gandhinagar

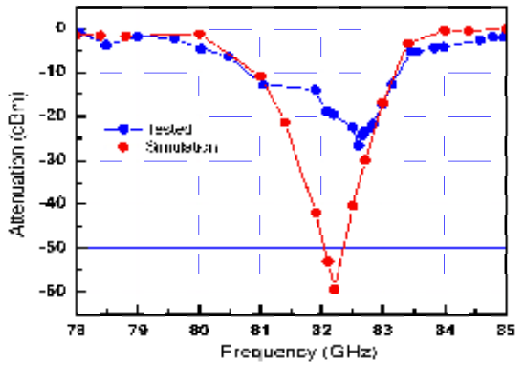
The Electron Cyclotron Emission (ECE) diagnostic is proposed to be used to measure the electron temperature profile in the Superconducting Steady State Tokamak (SST-1) being constructed at IPR. The ECE power intensity would be in the range of 10^{-3} to 1 µW in the millimeter frequency range.

The radiometer of 60 – 90 GHz frequency will be used in first phase operation of SST-1. The gyrotron at 82.6 GHz used in ECRH system has a very high power output of ~ 100 KW. The radiometer components *i.e.* the mixer and amplifiers are very low power sensitive devices. Hence the high input powers in the range of kilowatts will damage these devices. It is possible to simultaneously use both ECE diagnostics and ECR heating only is if we remove this 82.6 GHz frequency from radiometer input. For this application, the development of 82.6±0.5 GHz notch (band-stop) filter is necessary for protecting the radiometer.

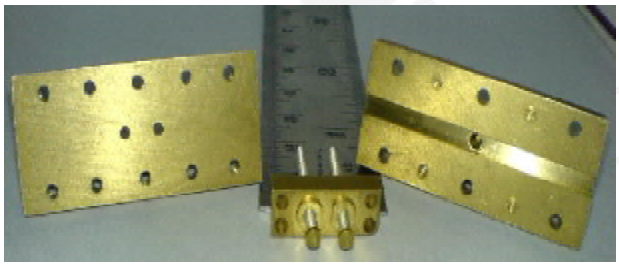
We have designed and developed a notch filter at 82.6±0.5 GHz. Theory of cavity coupling through an iris was used to calculate the physical dimensions of the waveguide notch filter. The 3-dimension structure of filter of this dimension was simulated using the HFSS software to optimize the required S-parameters. The filter was then fabricated using the optimized dimensions and tested for millimeter wave frequency response. The filter was then tuned to achieve maximum attenuation of ~ 28 dB at 82.6 GHz, which is quite close to the simulated value of the attenuation.



The fully assembled filter unit



Simulation and tested data of the filter attenuation



The various components of the notch filter

Notch (Band Stop) center frequency	: 82.6 GHz
Bandwidth	: > ± 1 GHz
Rejection at Notch frequency	: < 25 dB
Pass Band Insertion loss	: > 3 dB

Main parameters of the notch filter

For further information regarding this component, please contact Mr. Hitesh Pandya <hitesh@ipr.res.in> or Mr. P. K. Atrey <atrey@ipr.res.in>

Dr. Sambran Pahari, Post-Doctoral Fellow of IPR, Gandhinagar, has received high commendations from the judges of the 2006 Itoh Project Prize in Plasma Turbulence. The award includes a citation and a cash prize and was presented to him at the 33rd European Physical Society Conference on Plasma Physics, held at Rome during June 2006.

Dr. Pahari is a PSSI member and was the receipient of the Buti Young Scientist award for the year 2004.

Buti Foundation Award

Nominations are invited for "The Buti Foundation Award" in the field of Plasma Science & Technology for the year 2007. This biennial award is instituted from endowment fund provided by Buti Foundation, New Delhi and will be given to a person below 45 years as on 1st Jan 2007 for innovative and outstanding research work done in India in the field of Plasma Science and Technology. The Award carries a Citation, a Medal and Cash Prize of Rs.50,000/- (Rupees Fifty Thousand Only).

Nominations are to be submitted in six copies and should consist of a two-page write-up summarising the contributions and achievements of the candidate together with his/her bio-data and a list of publications indicating ten best publications of which five should preferably be from the last five years. Nominations may be sent by the Head of Academic & Research Institutions, Vice-Chancellors and Fellows of the Indian Academies of Science and Engineering. The Proforma for nomination is available at our website (http://www.prl.res.in). Nominations should be sent in an envelope marked 'confidential', addressed to the Director, Physical Research Laboratory, so as to reach him on or before June 30, 2007.

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PLASMA-2007

6th to 10th December 2007, Ahmedabad
http://plasma2007.pssi.in/

PSSI Awards - 2006

The two Buti Young Scientist Awards were presented to the following persons ;
Ruchi Mishra of Dr. H.S Gour University, Sagar (MP) for the presentation entitled *"Shear driven electrostatic Ion-cyclotron instability in a current-less plasma : A study using loss-cone distribution function"*
P. Bandhyopadhyay of IPR, Gandhinagar for his presentation entitled *"Experimental study of nonlinear solitory waves in a strongly coupled dusty plasma"*

The PSSI- Poster awards (Sponsored by MNIT, Jaipur) were presented to ;
H. Singhal of RRCAT, Indore for the poster titled *"On the use of ionization induced self de-focussing for efficient harmonic generation from plasma plumes"*
Sudeshna Lahiri of Dinabandhu Mahavidyalaya, Bongaon for the poster titled *"Numerical analysis of three-dimensional electric field in electrostatic precipitators".*

Mr. Z. H. Sholapurwala of the Zeonics Group, Bangalore has instituted two annual awards for poster presentations for two outstanding works on engineering aspects of Fusion Science and Technology. The first and second prizes for this award will carry a certificate of merit and a cash prize of Rs. 4000/- and Rs. 2000/- respectively. This award will begin from this year. Please visit the PSSI website for more details.

National Fusion Program Update

The National Fusion program in its first initiative after the workshop held in November 2006, has in principle, sanctioned funds for 23 project proposals in the first phase out of the 90 odd proposals received. While 5 projects have been finally cleared, the remaining are in various stages of process and will be cleared for funding in the coming months. Please see the NFP weblink **http://nfp.pssi.in/** for details regarding the NFP, NFP project funding procedures and also project status.

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