Microwave diagnostic for fusion energy research

Furtula, Vedran; Salewski, Mirko; Korsholm, Søren Bang; Leipold, Frank; Nielsen, Stefan Kragh; Bindslev, Henrik; Michelsen, Poul; Meo, Fernando; Jessen, Martin; Holm, John Hammer

Publication date: 2008

Citation (APA):

General rights
Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.
Microwave Diagnostic For Fusion Energy Research

By Vedran Furtula(1)
and
M.Salewski(1), S.B.Korsholm(1), F.Leipold(1), S.K.Nielsen(1),
H.Bindslev(1), P.Michelsen(1), F.Meo(1,2), M.Jessen(1), J.Holm
(1), S.Nimb(1)
(1) Risø National Laboratory - DTU, OPL-PLF, Denmark
(1) CTS-AUG, IPP Institute of Plasma Physics, MPG-Research
Center, Germany
Presentation type: talk

An introduction to current fusion energy research is given, emphasizing basic concepts of fusion plasmas confined by strong magnetic fields. A joint international research and development project has been started and is set out to build a machine on the plasma confinement principle with the vision to obtain more energy from fusion than is required for the operation of the device. This 5 billion Euro international project ITER is currently being built in Cadarache, France. One of the scientific cornerstones of the ITER mission is to study the physics of fast particles generated in the fusion process. For this purpose, a number of diagnostics are being developed which can measure these dynamics. Collective Thomson scattering (CTS) can fulfill this research objective at ITER by the use of electromagnetic waves in the millimeter range generated by 1 MW gyrotrons at 60 GHz. A CTS system for ITER is being developed at Risø DTU. One of the most critical components in a transmission line for microwaves in ITER is a set of mirrors. A full-scale mock-up of these mirrors has been constructed. We discuss software tools for 3-D simulations and techniques to characterize the microwave beams, e.g. network/spectrum analyzer, robot etc.