

# Fusion Science and Technology

CONTENTS / JANUARY 2008—VOL. 53, NO. 1

## SPECIAL ISSUE ON ELECTRON CYCLOTRON WAVE PHYSICS, TECHNOLOGY, AND APPLICATIONS—PART 2

Guest Editor: Mark Henderson

iii Comments / *Nermin A. Uckan*

v Preface / *Mark A. Henderson*

### TECHNICAL PAPERS

- 1 Recent Developments in the Theory of Electron Cyclotron Waves /  
*Emanuele Poli*
- 12 Overview of Electron Cyclotron Heating and Electron Cyclotron Current Drive  
Launcher Development in Magnetic Fusion Devices / *Sante Cirant*
- 39 Transmission Line Technology for Electron Cyclotron Heating / *J. L. Doane,  
R. A. Olstad*
- 54 Optimization of Electron Cyclotron Current Drive in the Magnetic Field  
Configuration of CHS / *Y. Yoshimura, T. Akiyama, M. Isobe, A. Shimizu,  
C. Suzuki, C. Takahashi, K. Nagaoka, S. Nishimura, T. Minami, K. Matsuoka,  
S. Okamura, CHS Group, S. Kubo, T. Shimosuma, H. Igami, T. Notake, T. Mutoh*
- 62 High-Power Millimeter-Wave Calorimetric Beam Absorbers / *A. Bruschi, W. Bin,  
S. Cirant, F. Gandini, V. Meller, V. Muzzini*
- 69 Fast Ion Collective Thomson Scattering Diagnostic for ITER: Design Elements /  
*E. Tsakadze, H. Bindslev, S. B. Korsholm, A. W. Larsen, F. Meo, P. K. Michelsen,  
S. Michelsen, A. H. Nielsen, S. Nimb, B. Lauritzen, E. Nonbøl, N. Dubois*
- 77 Detailed Beam-Pattern Calculations for the ITER Electron Cyclotron Heating and  
Current Drive Upper Launcher / *P. Platania, C. Sozzi*
- 88 Identification of Fast Particle Triggered Modes by Means of Correlation Electron  
Cyclotron Emission on Tore Supra / *M. Goniche, G. T. A. Huysmans, F. Turco,  
P. Maget, J. L. Ségui, J. F. Artaud, G. Giruzzi, F. Imbeaux, P. Lotte, D. Mazon,  
D. Molina, V. S. Udintsev*
- 97 Beam Combination and Routing at High Power with a Ring-Type Waveguide  
Millimeter-Wave Resonator / *A. Bruschi, S. Cirant, A. Moro, A. Simonetto*
- 104 Mechanical Design Aspects of a "Long-Waveguide" Version of the Remote  
Steering ECRH Upper Port Launcher for ITER / *D. M. S. Ronden,  
M. Van den Berg, W. A. Bongers, B. S. Q. Elzendoorn, M. F. Graswinckel,  
B. Lamers, K. Van Nigtevecht, A. G. A. Verhoeven, M. A. Henderson*

(Continued)

# CONTENTS / JANUARY 2008—VOL. 53, NO. 1

(Continued)

- 114** Electron Cyclotron Heating Applied to the JT-60U Tokamak / *K. Hoshino, T. Suzuki, A. Isayama, S. Ide, H. Takenaga, H. Kubo, T. Fujita, Y. Kamada, T. Fujii, T. Tsuda, JT-60 Team, K. Ida, S. Inagaki*
- 130** Relativistic Dispersion Relation of Electron Cyclotron Waves / *Daniela Farina*
- 139** Critical Design Issues of the ITER ECH Front Steering Upper Launcher / *M. A. Henderson, R. Chavan, R. Bertizzolo, D. Campbell, J. Duron, F. Dolizy, R. Heidinger, J.-D. Landis, G. Saibene, F. Sanchez, A. Serikov, H. Shidara, P. Spaeh*
- 159** Design of Circular Corrugated Waveguides to Transmit Millimeter Waves at ITER / *J. L. Doane*
- 174** ECH/ECCD Applications for MHD Studies and Automatic Control in FTU Tokamak / *S. Cirant, J. Berrino, P. Buratti, G. D'Antona, F. Gandini, G. Granucci, E. Iannone, E. Lazzaro, V. Meller, V. Muzzini, P. Smeulders, O. Tudisco*
- 184** Radiation Shielding Analyses for the ITER Upper Port ECRH Launcher / *A. Serikov, U. Fischer, R. Heidinger, H. Tsige-Tamirat, Y. Luo*
- 196** First Measurements of Oblique ECE with a Real-Time Movable Line of Sight on TCX / *T. P. Goodman, V. S. Udintsev, I. Klimanov, A. Mueck, O. Sauter, C. Schlatter*
- 208** Design of the ITER Upper Port Electron Cyclotron Heating and Current Drive System Based on Remote Steering / *M. F. Graswinckel, M. A. Van den Berg, W. A. Bongers, A. J. H. Donné, A. P. H. Goede, N. Lopes Cardozo, D. M. S. Ronden, A. G. A. Verhoeven*
- 220** Possible Improvements to a Remote Steering Launcher for Localized Electron Cyclotron Current Drive / *M. A. Henderson, C. P. Moeller*
- 237** Nonthermal Electron Bernstein Emission in NSTX-Like Discharges / *R. W. Harvey, A. P. Smirnov, E. Nelson-Melby, G. Taylor, S. Coda, A. K. Ram*
- 246** Electrical Powering Concept for ITER Electron Cyclotron Radio-Frequency Sources / *D. Fasel, T. Bonicelli, M. A. Henderson, M. Q. Tran*

## TECHNICAL NOTES

- 254** ECCD Experiments in the TJ-II Stellarator / *A. Fernández, A. Cappa, F. Castejón, J. M. Fontdecaba, K. Nagasaki*
- 261** Effects of Two-Dimensional Inhomogeneity in O-X Mode Conversion in Tokamak Plasmas / *E. D. Gospodchikov, A. G. Shalashov, E. V. Suvorov*

## CORRIGENDUM

- 279** Electron Cyclotron Heating for W7-X: Physics and Technology / *V. Erckmann, P. Brand, H. Braune, G. Dammertz, G. Gantenbein, W. Kasperek, H. P. Laqua, H. Maassberg, N. B. Marushchenko, G. Michel, M. Thumm, Y. Turkin, M. Weissgerber, A. Weller, W7-X ECRH Team at IPP Greifswald, W7-X ECRH Team at FZK Karlsruhe, W7-X ECRH Team at IPF Stuttgart*