

Table of Contents

<p>Preface: 23rd Topical Conference on Radiofrequency Power in Plasmas</p> <p>REVIEW PAPERS</p> <p>Fifty years of progress in ICRF, from first experiments on the model C stellarator to the design of an ICRF system for DEMO</p> <p>J.-M. Noterdaeme</p> <p>INVITED PAPERS</p> <p>3D full wave fast wave modeling with realistic antenna geometry and SOL plasma</p> <p>N. Bertelli, S. Shiraiwa, G. J. Kramer, X. Yang, T. DeHaas, C. Lau, B. Van Compernolle, E.-H. Kim, and J. C. Wright</p> <p>First lower hybrid current drive experiments on the WEST tokamak</p> <p>M. Goniche, J. F. Artaud, C. Bourdelle, J. Bucalossi, C. Desgranges, L. Delpech, P. Devynck, R. Dumont, A. Ekedahl, N. Fedorczak, J. Garcia, C. Gil, J. Gunn, C. C. Klepper, P. Maget, D. Mazon, O. Meyer, J. Morales, Ph. Moreau, R. Nouailletas, Y. Peysson, X. Regal-Mezin, C. Reux, F. Saint-Laurent, and D. Vezinet</p> <p>Ion cyclotron range of frequency heating for SPARC</p> <p>Y. Lin, S. J. Wukitch, P. T. Bonoli, A. Seltzman, and J. C. Wright</p> <p>Main experimental results and challenges in ICRF heating on EAST</p> <p>Xinjun Zhang, C. M. Qin, L. N. Liu, Y. P. Zhao, Y. Z. Mao, H. Yang, B. Lv, J. F. Chang, J. Huang, L. Wang, S. Yuan, X. Deng, G. Chen, Y. Cheng, S. Q. Ju, K. Zhang, J. A. Yuan, M. H. Li, B. J. Ding, X. Z. Gong, B. N. Wan, Y. T. Song, J. G. Li, L. Ai, and L. L. Ping</p> <p>Overview of recent ICRF studies and RF-related wave-field measurements on ASDEX upgrade</p> <p>R. Ochoukov, R. Bilato, V. Bobkov, R. Casagrande, H. Faugel, Ye. O. Kazakov, A. Kostic, M. J. Mantsinen, K. G. McClements, J.-M. Noterdaeme, P. Schneider, G. Suárez López, W. Tierens, M. Usoltceva, M. Weiland, and W. Zhang</p> <p>Role of the edge and scrape-off layer plasma in lower hybrid current drive experiment on Alcator C-Mod</p> <p>S. G. Baek, B. Biswas, P. T. Bonoli, D. Brunner, I. C. Faust, A. E. Hubbard, J. W. Hughes, B. LaBombard, R. T. Mumgaard, M. Porkolab, S. Shiraiwa, G. M. Wallace, and S. J. Wukitch</p> <p>ICRH options for JET-ILW DTE2 operation</p> <p>E. Lerche, D. Van Eester, P. Jacquet, F. Casson, Y. Baranov, P. Dumortier, D. Gallart, J. Graves, P. Huynh, T. Johnson, Y. Kazakov, V. Kiptily, K. Kirov, M. Machielsen, M. Mantsinen, I. Monakhov, and J. Ongena</p> <p>Recent LHCD experiments on HL-2A and LHCD system development on HL-2M</p> <p>B. Lu, X. Y. Bai, Y. Peysson, Y. P. Zhang, D. Mazon, G. L. Xiao, X. L. Zou, H. Zeng, J. Liang, C. Wang, Y. L. Chen, A. Ekedahl, L. Delpech, J. Q. Wang, K. Fenga, H. Wang, J. Rao, B. Li, S. Wang, X. M. Song, J. Cheng, Y. Zhou, Z. B. Shi, J. Hillairet, E. Bertrand, G. Giruzzi, and T. Hoang.</p>	<p>010001</p> <p>020001</p> <p>030001</p> <p>030002</p> <p>030003</p> <p>030004</p> <p>030005</p> <p>030006</p> <p>030007</p> <p>030008</p>
---	---

Characterizations and first plasma operation of the WEST load-resilient actively cooled ICRF launchers	030009	Direct local electric field measurements in the sheaths of the ICRF antenna in IShTAR Ana Kostic, Kristel Cromb��, Ralph Dux, Michael Griener, Mari Usoltceva, Ilya Shesterikov, Elijah H. Martin, and Jean-Marie Noterdaeme	050002
W. Helou, F. Durodi��, J. Hillairet, E. Lerche, G. Lombard, D. Milanesio, P. Mollard, J.-M. Bernard, N. Charabot, F. Clairet, L. Colas, Y. Moudden, B. Santraine, Y. T. Song, G. Urbanczyk, R. Volpe, Y. S. Wang, Q. X. Yang, and V. Bobkov			
Aperture impedance matching for lower hybrid current drive launchers	030010	3D RAPLICASOL model of simultaneous ICRF FW and SW propagation in ASDEX upgrade conditions M. Usoltceva, W. Tierens, A. Kostic, J.-M. Noterdaeme, R. Ochoukov, and W. Zhang	050003
A. H. Seltzman, S. Shiraiwa, G. M. Wallace, and S. Wukitch			
Synergistic ICRH and NBI heating for fast ion generation and maximising fusion rate in mixed plasmas at JET	030011	Coupling and near-field simulations of ion-cyclotron antennas: Numerical validation of the perfectly matched layer technique for several density profiles S. Ceccuzzi, A. Cardinale, G. L. Ravera, and A. A. Tuccillo	050004
K. K. Kirov, Y. Kazakov, M. Nocente, J. Ongena, Y. Baranov, F. Casson, J. Eriksson, L. Giacomelli, C. Hellesen, V. Kiptily, R. Bilato, K. Crombe, R. Dumont, P. Jacquet, T. Johnson, E. Lerche, M. Mantsinen, D. Van Eester, J. Varje, and H. Weisen			
ICRH coupling optimization and impurity behavior in EAST and WEST	030012	Analysis of metallic impurities during the application of three-ion ICRH scenario at JET-ILW A. Chomiczewska, N. Krawczyk, Ye. O. Kazakov, V. Bobkov, E. Kowalska-Strz��ciwilk, E. Lerche, M. J. Mantsinen, J. Ongena, G. Pucella, T. P��tterich, and D. Van Eester	050005
G. Urbanczyk, L. Colas, X. J. Zhang, W. Helou, Y. P. Zhao, J. Hillairet, X. Z. Gong, E. Lerche, G. Lombard, Q. C. Ming, M. Goniche, Z. Ling, P. Mollard, V. Bobkov, X. D. Yang, O. Meyer, L. N. Lu, J. Gunn, C. Yan, C. Desgranges, J. M. Bernard, T. Zhang, F. Clairet, B. P��gouri��, D. Van Eester, R. Dumont, W. Tierens, F. Durodi��, B. Zhang, and J. G. Li			
IC:EXPERIMENTS			
Detection of edge ion cyclotron emission driven by energetic deuterium ions in the EAST	040001	Edge ICRF simulations in 3D geometry: From MHD equilibrium to coupling determination G. Su��rez L��pez, M. Cianciosa, M. Dunne, T. Lunt, R. Ochoukov, S. K. Seal, E. Strumberger, W. Tierens, M. Willensdorfer, and H. Zohm	050006
L. Liu, X. Zhang, Y. Zhu, C. Qin, Y. Zhao, S. Yuan, Y. Mao, M. Li, J. Chen, H. Li, and L. Ai			
Investigation of ion bombardment role on radio-frequency arcs ignition	040002	Influence of ELMs on ICRF wave scattering W. Zhang, T. Y. Xia, W. Tierens, V. Bobkov, and J.-M. Noterdaeme	050007
Riccardo Casagrande, Ferdinando Gasparini, Helmut F��nfgelder, Gerhard Siegl, and Jean-Marie Noterdaeme			
Measurements of the scattering matrix of the W7-X prototype ICRH antenna and capacitor units	040003	Recent progress in microscale modeling of RF sheaths J. R. Myra, D. Curreli, M. T. Elias, and T. G. Jenkins	050008
I. Stepanov, V. Borsuk, K. Cromb��, D. Casta��o-Bardawill, G. Offermanns, J. Ongena, B. Schweer, and M. Vervier			
First application of Ion Cyclotron resonant frequency waves on WEST plasma scenarios	040004	Full wave simulation of RF waves in cold plasma with the stabilized open-source finite element tool ERMES Ruben Otin, Wouter Tierens, Felix Parra, Shafa Aria, Ernesto Lerche, Philippe Jacquet, Igor Monakhov, Pierre Dumortier, and Bart Van Compernolle	050009
L. Colas, G. Urbanczyk, M. Goniche, E. A. Lerche, J. Hillairet, W. Helou, G. Lombard, P. Mollard, V. Bobkov, O. Meyer, J. Gunn, C. Desgranges, V. Basiuk, B. P��gouri��, R. Dumont, J. F. Artaud, C. Bourdelle, N. Fedorczak, F. Durodi��, and J.-M. Bernard			
Improved operating space of the ICRF system in ASDEX upgrade	040005	Helicon wave coupling optimization and possible parasitic excitation of slow waves near the edge plasma of KSTAR E.-H. Kim, M. Ono, N. Bertelli, S. Wang, and H. K. Park	050010
V. Bobkov, R. Bilato, H. Faugel, H. F��nfgelder, Ye. O. Kazakov, M. Mantsinen, J.-M. Noterdaeme, R. Ochoukov, Th. P��tterich, G. Su��rez L��pez, W. Tierens, and W. Zhang			
IC:INTERACTION OF WAVES WITH THE EDGE PLASMA? MODELING AND EXPERIMENTS?			
A 1D coupled transport/cold plasma wave model for parallel ponderomotive density modification near RF actuators	050001	Edge plasma parameters affecting fast wave and slow wave intensities in scrape off layer L. Ai, L. N. Liu, C. M. Qin, X. J. Zhang, and Y. P. Zhao	050011
R. L. Barnett, D. L. Green, J. D. Lore, D. N. Smithe, J. R. Myra, and C. L. Waters			
IC:OTHER MODELING			
Modelling of ICRF heating for JET T and D-T plasmas		Modelling of ICRH and ICRH-NBI synergy in high power JET scenarios using European transport simulator (ETS) P. Huynh, E. A. Lerche, D. Van Eester, R. Bilato, J. Varje, T. Johnson, O. Sauter, L. Villard, and J. Ferreira	060003
D. Gallart, M. J. Mantsinen, P. Jacquet, K. Kirov, E. Lerche, and J. Wright			
Numerical analysis of helicon plasma power deposition on helicon physics prototype experiment		Ping Lan-Lan, Zhang Xin-Jun, and Yang Hua	060002

Off-axis current drive with very high harmonic fast waves for CFETR Y. Q. Yang, X. J. Zhang, Y. P. Zhao, C. M. Qin, Y. Z. Mao, and H. Yang	060004	Conceptual study of an ICRH traveling wave antenna (TWA) for T-15MD at 60 MHz A. V. Melnikov, J. Ongena, A. M. Messiaen, R. Ragona, A. V. Sushkov, Ye. O. Kazakov, Dirk Van Eester, Yu. N. Dnestrovskii, P. P. Khvostenko, and I. N. Roy	070007
Effect of poloidal magnetic field and cross-coupling on a set of traveling wave antenna sections for the ICRH of fusion reactor plasmas A. Messiaen, R. Ragona, R. Koch, V. Maquet, and J. Ongena	060005	Three-dimensional RF and circuit modelling of the revised ITER ICRF launcher design Fabrice Louche, Frederic Durodié, Walid Helou, Philippe U. Lamalle, and François Calarco	070008
The simulation of the antenna performance enveloped by the reentry plasma sheath with COMSOL multiphysics Jiahui Zhang, Yanming Liu, and Xiaoping Li	060006	The RF heating systems of Italian DTT G. Granucci, B. Baiocchi, A. Bruschi, S. Garavaglia, L. Figini, F. Fanale, W. Bin, S. Ceccuzzi, A. Cardinali, G. L. Ravera, A. Tuccillo, and V. P. Loschiavo	070009
A comparison of RF heating calculated with the CQL3D Fokker-Planck solver and with a Monte-Carlo code Yu. V. Petrov and R. W. Harvey	060007	RF network analysis of the WEST ICRH antenna with the open-source python scikit-RF package Julien Hillairet	070010
A WKB based preconditioner for the 1D Helmholtz wave equation D. L. Green, E. D'Azevedo, D. B. Batchelor, N. Bertelli, C. Lau, R. L. Barnett, and J. F. Caneses Marin	060008	An ICRF strap antenna solution exploiting the high impedance technique Daniele Milanesio, Riccardo Maggiora, and Gianluca Dassano	070011
Computation of ponderomotive force in 3D FDTD simulation David Smithe, Alexei Pankin, Tom Jenkins, Jim Myra, and Rhea Barnett	060009	Impedance measurements with voltage and current probes on RF driven ICP torch Qiujiqiao Zhou, Peng Zhao, Chuanwen Geng, and Yuedong Meng	070012
3D simulation of ICRF power injected into EAST plasmas via VSim software Chunyun Gan, David Smithe, Nong Xiang, and Xinjun Zhang	060010	Further studies on the ITER ICRF antenna grounding P. Dumortier, F. Durodié, F. Louche, M. Vervier, A. Křivská, A. Messiaen, and I. Stepanov	070013
IC:RF SYSTEM TECHNOLOGY			
Study of the ohmic losses of a traveling wave antenna section in view of application on DEMO V. Maquet, A. Messiaen, and R. Ragona	070001	Progress on the design of a DEMO high power ICRH travelling wave antenna mock-up to be tested on WEST Riccardo Ragona, Tristan Batal, Julien Hillairet, André Messiaen, Mehdi Firdaouss, Jean-Michel Bernard, and Jozef Ongena	070014
Overview of TAE technologies' HHFW project on LAPD X. Yang, M. Binderbauer, Y. Song, T. Carter, R. Goulding, Q. Yang, G. Chen, Y. Song, J. Schroeder, T. DeHaas, B. Van Compernolle, F. Ceccherini, L. Galeotti, I. Allfrey, S. Detrick, A. Sibley, P. Feng, T. Valentine, W. Waggoner, C. Lau, S. Shiraiwa, J. Wright, N. Bertelli, M. Ono, and W. Horton	070002	LH:EXPERIMENTS AND MODELING	
The ICRH system for the stellarator Wendelstein 7-X J. Ongena, A. Messiaen, Ye.O. Kazakov, B. Schweer, I. Stepanov, M. Vervier, K. Cromb��, M. Van Schoor, V. Borsuk, D. Casta��o-Bardawil, A. Kraemer-Flecken, K. P. Hollfeld, G. Offermanns, D. A. Hartmann, J. P. Kallmeyer, and R. C. Wolf	070003	Design and test analysis of magnetic probe for parallel wave-number measurement of lower hybrid waves in EAST Y. F. Wang, M. H. Li, B. J. Ding, S. G. Baek, P. T. Bonoli, F. K. Liu, J. F. Shan, Y. C. Li, and C. B. Wu	080001
Similarity relations of the ICRF systems between two tokamaks, JET and ITER Jungpyo Lee, Roberto Bilato, Hyeonjun Lee, and Erwin F. Jaeger	070004	Parametric decay instabilities of lower hybrid wave current drive on CFETR T. T. Zhou, N. Xiang, J. L. Chen, C. Y. Gan, and G. Z. Jia	080002
Recent improvements to the ICRF antenna coupling code "RAPLICASOL" W. Tierens, G. Su��rez L��pez, R. Otin, G. Urbanczyk, L. Colas, R. Bilato, W. Zhang, V. Bobkov, and J.-M. Noterdaeme	070005	Electromagnetic modeling of parametric instability for slow waves in lower hybrid frequency range J. Bao, Z. Lin, W. L. Zhang, and D. Li	080003
The prospects of ICRF generators at ASDEX upgrade H. Faugel, V. Bobkov, and H. F��nfgelder	070006	Coupling properties of the LHCD launchers in the WEST experiments L. Delpech, A. Ekedahl, A. Liang, J. Achard, A. Armitano, P. Bienvenu, X. Courtois, M. Goniche, R. Nouailletas, and X. Regal-Mezin	080004
Comparative modeling of lower hybrid wave coupling with 2.45 GHz and 4.6 GHz launchers on EAST M. H. Li, B. J. Ding, L. Liu, M. Wang, H. Jia, F. K. Liu, J. F. Shan, Y. F. Wang, C. B. Wu, Y. C. Li, J. Hillairet, Y. Peysson, M. Goniche, and A. Ekedahl			
080005			

HL-2M LHCD antenna development	X. Y. Bai, J. Liang, K. Feng, B. Lu, H. Zeng, C. Wang, J. Q. Wang, Y. L. Chen, X. M. Zhou, M. Huang, and J. Rao	080006	Megawatt power generation of the dual-frequency gyrotron for TCV at 84 and 126 GHz, in long pulses	J.-P. Hogge, S. Alberti, K. A. Avramidis, A. Bruschi, W. Bin, F. Cau, F. Cismonti, J. Dubray, D. Fasel, G. Gantenbein, S. Garavaglia, J. Genoud, T. P. Goodman, S. Illy, J. Jin, F. Legrand, R. Marchesin, B. Marlétaz, J. Masur, A. Moro, C. Moura, I. Gr. Pagonakis, E. Périal, L. Savoldi, T. Scherer, U. Siravo, M. Thumm, M. Toussaint, and M.-Q. Tran	090006
Nonlinear interactions of electrons with lower hybrid waves	Yueheng Huang, Nong Xiang, Dehui Li, Xueyi Wang, and Yu Lin	080007			090006
Initial TRANSP simulations of lower hybrid heating and current drive in EAST	W. Choi, F. Poli, M. Gorenlenkova, R. Andre, M. H. Li, B. Ding, H. Du, L. Zhang, S. Shiraiwa, and Y. Petrov	080008	OTHER		
Plasma start-up experiment and modelling on the TST-2 spherical tokamak	Y. Takase, A. Ejiri, N. Tsujii, S. Yajima, Y. Aoi, Y. Iida, K. Iwasaki, Y. Kawamata, Y. Ko, K. Matsuzaki, C. P. Moeller, Y. Peng, J. Rice, S. Sakamoto, H. Yamazaki, and Y. Yoshida	080009	Dielectric kernels for Maxwellian tokamak plasmas	P. U. Lamalle	100001
Simulation of lower hybrid current drive in the presence of inductive electric field in the FT-2 tokamak	A. Saveliev, N. Teplova, G. Troshin, E. Gusakov, S. Lashkul, and D. Kouprienko	080010	AUTHOR INDEX		
Scoping study of lower hybrid current drive for CFETR	G. M. Wallace, C. B. Wu, S. G. Baek, P. T. Bonoli, B. J. Ding, M. H. Li, L. Liu, and S. Shiraiwa	080011	Author Index: 23rd Topical Conference on Radiofrequency Power in Plasmas		010002
CMA diagrams, inverse wave normal surfaces, and fast and slow wave propagation in the lower hybrid range of frequencies	R. I. Pinsker, J. J. Larson, and P. J. Adrian	080012			
EC: EXPERIMENTS, MODELING AND TECHNOLOGY					
Modeling of solenoid-free start-up using 2nd harmonic electron cyclotron heating and current drive in QUEST	M. Ono, N. Bertelli, H. Idei, K. Hanada, T. Onchi, S. Kojima, and H. Elserafy	090001			
Millimeter-wave detector for gyrotron power monitoring	Weiye Xu, Handong Xu, Fukun Liu, and Xiaojie Wang	090002			
Development status of KSTAR ECH system	M. Joung, S. J. Wang, S. G. Kim, J. W. Han, I. H. Lee, and J. G. Kwak	090003			
Operations with spherical calorimetric loads in different configurations at gyrotron test stands at EPFL and QST	W. Bin, A. Bruschi, F. Fanale, F. Lucca, S. Alberti, G. Carannante, M. Cavinato, T. Goodman, J.-P. Hogge, F. Legrand, F. Sanchez, K. Takahashi, F. Albajar, I. Chelis, F. Dell'Era, D. Fasel, G. Gantenbein, G. Granucci, R. Ikeda, S. Illy, Z. Ioannidis, J. Jelonnek, V. Mellera, Minelli, A. Nardone, Y. Oda, I. Pagonakis, N. Rispoli, T. Rzesnicki, Sartori, M. Silva, A. Simonetto, M. Thumm, and I. Tigelis	090004			
Measured and predicted electron cyclotron power deposition and current drive widths in DIII-D	C. C. Petty, Xi Chen, M. W. Brookman, R. I. Pinsker, J. D. Pizzo, and M. E. Austin	090005			