PREFACE

SIXTEENTH JOINT WORKSHOP ON ELECTRON CYCLOTRON EMISSION AND ELECTRON CYCLOTRON RESONANCE HEATING

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The Sixteenth Joint Workshop on Electron Cyclotron Emission and Electron Cyclotron Resonance Heating (EC-16) was held in Sanya, China, on April 12–15, 2010. The Institute of Plasma Physics Chinese Academy of Sciences (ASIPP) hosted EC-16, which included 11 invited presentations, 28 oral presentations, and 34 poster presentations. The selection of papers and the scientific program was made by the international program committee (IPC) consisting of Ron Prater, General Atomics, United States, Chair; Young Soon Bae, KSTAR, Korea; Daniela Farina, IFP, Italy; Bob Harvey, CompX, United States; Shin Kubo, NIFS, Japan; Mark Henderson, ITER, France; Y.-R. Lin-Liu, National Central University, Taiwan; John Lohr, General Atomics, United States; Gary Taylor, PPPL, United States; and George Vayakis, ITER, France. The IPC and the EC-16 participants are grateful for the hard work of the local organizing committee of Jiangang Li, Baonian Wan, Shaohua Dong, and Yuan Wang of ASIPP.

Experiments involving high-power electron cyclotron waves for heating and current drive are being done or planned in many plasma confinement devices. Papers with results or plans for ASDEX Upgrade, DIII-D, EAST, HELIOTRON-J, HL-2A, JET, KSTAR, LHD, QUEST, T-10, TCV, TEXTOR, and most importantly ITER were presented. The successful exploitation of the attractive physics characteristics and applications of electron cyclotron resonance heating (ECRH) and electron cyclotron current drive are being explored in these devices, and extrapolation to ITER looks very promising. All of these devices also have or plan to have diagnostics operating on electron cyclotron emission (ECE) or, in the case of low field devices, on electron Bernstein wave emission, and several papers explored the physics and technological challenges in transferring this important diagnostic from present-day devices to ITER. Papers on recent advances in technology for ECE and ECRH were also presented. The low-loss transmission line for ITER is well advanced and based on successful implementation in a large number of installations, and refinements such as high-power, low-loss switches and improved mode converters and other components promise even higher transmission efficiency in the future. The development of gyrotrons—the power source for ECRH applications—with high power and high efficiency is a major technological accomplishment, and gyrotrons meeting the nominal requirements for ITER have been demonstrated. Strong progress was reported on increasing the gyrotron power from 1 MW to the 2-MW range for improved cost efficiency. And, papers on electron cyclotron theory encompassing both theory and modeling of electron cyclotron wave propagation and absorption were presented. Published here are expanded versions of some of the papers presented at EC-16.

It was agreed that the next workshop in this series, EC-17, will be held in the Netherlands in 2012.