

Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

Interactions of electrons with multiple lower hybrid waves¹

GUOZHANG JIA, NONG XIANG, YUEHENG HUANG, Institute of Plasma Physics, Chinese Academy of Sciences, XUEYI WANG, YU LIN, Physics Department, 206 Allison Laboratory, Auburn University, USA — The interactions between electrons and multiple electrostatic plane waves with different phase velocities. It is well known that as the resonance overlap occurs, the motions of trapped electrons become stochastic which results in electron heating. However, in these studies the evolution of the wave field is not taken into account. In this work, the interactions between electrons and multiple lower hybrid waves are investigated via particle-in-cell (PIC) simulations based on GEFI framework [Yu Lin, Xueyi Wang, Zhihong Lin and Liu Chen, Plasma Phys. Control. Fusion 47, 2005, 657]. It is shown that the orbits of trapped electrons in each wave field are altered in the presence of other lower hybrid waves. As a result, the damping of this wave is significantly enhanced. As the resonances overlap, a corresponding plateau of the electron distribution function can be formed. The results are helpful to understand the interactions of lower hybrid waves and plasmas during lower hybrid current drive in Tokamaks.

¹This work was supported by NSFC under Nos. 11475220, 11405218 and 11405208, by NSF grant NSF-AGS-1405225 and DoE grant DESC0010486 to Auburn University

Nong Xiang
Institute of Plasma Physics, Chinese Academy of Sciences

Date submitted: 24 Jul 2015

Electronic form version 1.4