Abstract Submitted
for the DPP13 Meeting of
The American Physical Society

The Mixed WKB-Full-Wave Approach and Its Application to Lower Hybrid Wave Propagation and Absorption ZHIXIN LU, Univ of California - San Diego, FULVIO ZONCA, ALESSANDRO CARDINALI, Associazione EURATOM-ENEA sulla Fusione, Frascati, Roma, Italy, CER, UNIV OF CALIFORNIA - SAN DIEGO TEAM, SCHOOL OF PHYSICS AND FUSION SIMULATION CENTER, PEKING UNIVERSITY, BEIJING, CHINA TEAM, ASSOCIAZIONE EURATOM-ENEA SULLA FUSIONE, FRASCATI, ROMA,ITALY TEAM, INSTITUTE FOR FUSION THEORY AND SIMULATION, ZHEJIANG UNIVERSITY, HANGZHOU, CHINA TEAM — The mixed WKB-full-wave approach for the calculation of the 2D mode structure in tokamak plasmas is further developed based on our previous work [1, 2]. A new scheme for numerical implementation of the mixed WKB-full-wave approach is formulated, based on scale separation and asymptotic analysis. Besides its capability to efficiently investigate the initial value problem for 2D mode structures and linear stability, in this work, the mixed WKB-full-wave approach is extended to the investigation of radio frequency wave propagation and absorption, e.g. lower hybrid waves. As a novel method, its comparison with other approaches, e.g. WKB and beam tracing methods, is discussed. Its application to lower hybrid wave propagation in concentric circular tokamak plasmas using FTU parameters is also demonstrated.

[1] A. Cardinali et al., Phys. Plasmas 10, 4199 (2003)
[2] Z. X. Lu et al., Phys. Plasmas, 19, 042104 (2012)

Zhixin Lu
Univ of California - San Diego

Date submitted: 07 Sep 2013 Electronic form version 1.4