



IAEA FEC 2016

Contribution ID: 491

Type: Poster

Non-inductive Electron Cyclotron Heating and Current Drive with Dual Frequency (8.2 /28 GHz) Waves in QUEST

Wednesday 19 October 2016 14:00 (4h 45m)

By means of dual 8.2 GHz and 28 GHz waves, the over dense 25 kA plasma with central high energetic-electron pressure was non-inductively built up and sustained for 0.4 s by Electron Bernstein Wave Heating (EBWH) effect between 8.2 GHz fundamental and 2nd harmonic Electron Cyclotron (EC) layers. Spontaneous Density Jumps (SDJs) have been clearly observed at a few times in a shot, and the electron density became over dense for the 8.2 GHz injection. The bulk electron temperature or pressure increased in the over dense region being fundamentally Doppler-shifted resonant with the parallel refractive index $N_{\parallel} > 4$ for the 8.2 GHz injection. Current-carrying energetic electrons with more than 200 keV were remarkably observed in the over dense region due to the 8.2 GHz EBWH effect.

Country or International Organization

Japan

Paper Number

EX/P4-50

Author: Dr IDEI, Hiroshi (Research Institute for Applied Mechanics, Kyushu University)

Co-authors: Ms HIGASHIJIMA, Aki (Kyushu University); Dr EJIRI, Akira (Graduate School of Frontier Sciences, The University of Tokyo); Prof. FUKUYAMA, Atsushi (Kyoto University); ZUSHI, Hideki (Riam Kyushu University); Mr NAKASHIMA, Hisatoshi (Kyushu University); Prof. HANADA, Kazuaki (Advanced Fusion Research Center, Research Institute for Applied Mechanics, Kyushu University); Prof. NAKAMURA, Kazuo (Kyushu University); Dr HASEGAWA, Makoto (Kyushu University); Dr WATANABE, Osamu (Kyushu University); Mr KAWASAKI, Shoji (Kyushu University); Dr ONCHI, Takumi (Kyushu University); Prof. IMAI, Tsuyoshi (Plasma Research Center, University of Tsukuba); Dr KARIYA, Tsuyoshi (Plasma Research Center, University of Tsukuba); Prof. TAKASE, Yuichi (University of Tokyo); Mr MISHRA, kishore (Kyushu University)

Presenter: Dr IDEI, Hiroshi (Research Institute for Applied Mechanics, Kyushu University)

Session Classification: Poster 4

Track Classification: EXW - Magnetic Confinement Experiments: Wave-plasma interactions; current drive; heating; energetic particles