Abstract Submitted
for the DPP16 Meeting of
The American Physical Society

Integrated Simulation Studies of Plasma Performances and Fusion Reactions in the Deuterium Experiment of LHD[1] S MURAKAMI, H YAMAGUCHI, M HOMMA, S MAETA, Y SAITO, A FUKUYAMA, Dpt. Nuclear Eng., Kyoto Univ., K NAGAOKA, NIFS, NINS, H TAKAHASHI, NIFS, NINS, Japan, H NAKANO, M OSAKABE, M YOKOYAMA, K TANAKA, K IDA, M YOSHINUMA, M ISOBE, NIFS, NINS, H TOMITA, Dpt. Quantum Eng., Nagoya Univ., K OGAWA, NIFS, NINS, LHD EXP GROUP TEAM — The deuterium experiment project from 2017 is planned in LHD, where the deuterium NBI heating beams with the power more than 30MW are injected into the deuterium plasma. Principal objects of this project are to clarify the isotope effect on the heat and particle transport in the helical plasma and to study energetic particle confinement in a helical magnetic configuration measuring triton burn-up neutrons. We study the deuterium experiment plasma of LHD applying the integrated simulation code, TASK3D [Murakami, PPCF2015], and the 5-D drift kinetic equation solver, GNET [Murakami, NF2006]. (i) More than 20% of ion temperature increment is obtained in the deuterium plasma ($n_D/n_H + n_D = 0.8$) due to the isotope effect assuming the turbulent transport model based on the H/He plasma experiment of LHD. (ii) The triton burn-up simulation shows the triton slowing down distribution and the strong magnetic configuration dependency of the triton burn-up ratio in LHD.

[1]This work was supported by JSPS KAKENHI Grant Number 26420851.

Sadayoshi Murakami
Department of Nuclear Engineering, Kyoto University

Date submitted: 12 Jul 2016 Electronic form version 1.4