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Simulation study of toroidal flow generation by ICRF minority heating in Alcator C-Mod plasma[1] S. MURAKAMI, Dpt. Nucl. Eng., Kyoto Univ., K. ITOH, NIFS, L.J. ZHENG, J.W. VAN DAM, IFS, UT, P. BONOLI, J.E. RICE, C.L. FIORE, PSFC, MIT, A. FUKUYAMA, Dpt. Nucl. Eng., Kyoto Univ. — The toroidal flow generation by the ICRF minority heating is investigated in the Alcator C-Mod plasma applying GNET code [1], in which the drift kinetic equation is solved in 5D phase-space. We obtain a steady state distribution of energetic minority ions and the flux surface averaged toroidal flow is evaluated. It is found that a co-directional toroidal flow is generated outside of the RF wave power absorption region and that the dominant part of toroidal flow does not depend on the sign of $k_{\|}$. The averaged toroidal flow velocity reaches about 30% of central ion thermal velocity ($P_{ICRF} \sim 1.7$MW)[2]. When we change the sign of the toroidal current we obtain a reversal of the toroidal flow velocity, which is consistent with the experimental observations. We show that the toroidal precession motion of energetic tail ions accelerated by the ICRF heating plays an important role in generating the averaged troidal flow. We also compare with the experimental results about the RF resonance location and plasma parameter dependencies [3].
[1] S. Murakami, *et al.*, Nucl. Fusion **46**, S425 (2006). [2] S. Murakami, *et al.*, Proc. 23rd IAEAFusion Energy Conference, **THW/P4-03** (2010). [3] J.E. Rice, *et al.*, Nucl. Fusion **42**, 510 (2002).

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