Abstract Submitted
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Effect of fast-ion loss on momentum transport in tokamak plasmas with toroidal field ripples MITSURU HONDA, TOMONORI TAKIZUKA, Japan Atomic Energy Agency, ATSUSHI FUKUYAMA, Kyoto University, MAIKO YOSHIDA, TAKAHISA OZEKI, Japan Atomic Energy Agency — One-dimensional transport code, TASK/TX, has been developed to study the plasma rotation and the radial electric field in tokamak plasmas [1]. The code simultaneously solves a set of the two-fluid equations in the quasi-toroidal coordinates coupled with Maxwell's equations and beam-ion slowing down equation. It is observed in JT-60U that the reduction of the toroidal field ripple by installing ferritic steel tiles tends to rotate the plasma in the co direction because the counter rotation caused by the fast-ion loss is suppressed [2]. A model of the ripple loss has been made to study the phenomena and the behavior of the beam ions affected by the ripples can be self-consistently calculated. Numerical solutions reproduce the reduction of the toroidal co-rotation with co and perpendicular NBIs as the ripple amplitude increases. The toroidal rotation varies with the ripple amplitude at constant pressure gradient, as is observed in JT-60U [2], and the radial electric field also changes near the peripheral. This implies the change of the toroidal rotation strongly relates to that of the radial electric field through the radial force balance.
[1] M. Honda and A. Fukuyama, submitted to J. Comput. Phys.
[2] M. Yoshida, et al., Plasma Phys. Control. Fusion **48** 1673 (2006).

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