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High BetaN Ion Internal Transport Barrier Discharges with Diverted configuration in KSTAR YONG-SU NA, S.J. PARK, C.Y. LEE, Seoul Natl Univ, Y.H. LEE, H.-S. KIM, W.-H. KO, S.G. LEE, J. CHUNG, Y.M. JEON, M.J. CHOI, S.W. YOON, NFRI — Recently, stationary ion internal transport barrier (ITB) discharges have been established in a diverted configuration with two or three neutral beam injection sources at q95˜4. To obtain the stable ion ITB with the diverted configuration, the H-mode transition was avoided by keeping a low density (˜1x10^{19}) and upper single null configuration which are unfavorable to H-mode in KSTAR [1]. The performance and neutron rate of the discharge is comparable to hybrid discharges with β_N <2.6, W_{MHD} <340 kJ, H_{89L} <2.3. Fully non-inductive current drive is obtained in addition to this high performance. This ITB discharges show high stability against the locked mode so to survive without disruption while with the locked mode. Moreover, the ion ITB could be re-formed following the natural mode unlocking. The locking threshold is investigated with the density scan. The ASTRA simulation coupled with the NUBEAM code was conducted for the transport analysis and the linear gyrokinetic analysis is performed and compared with fluctuation measurements to study the ITB dynamics. This scenario is suggested as a new advanced scenario for steady-state high performance with low divertor heat load at ITER-relevant collisionality which doesn't require a delicate profile feedback control. Keywords : Ion Internal Transport Barrier, Diverted Configuration Reference [1] S.W. Yoon et al. 2011 Nucl. Fusion 51 113009

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