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L-H power threshold studies under non-axisymmetric magnetic field in KSTAR WON-HA KO, Y. IN, H.S. KIM, H.H. LEE, J.H. LEE, Y.M. JEON, J. SEOL, National Fusion Research Institute, K. IDA, National Institute for Fusion Science, S.W. YOON, Y.K. OH, National Fusion Research Institute, H. PARK[1], Ulsan National Institute of Science and Technology — An exceptionally low level of H-mode power threshold (P_{TH}), as well as its dependence on non-axisymmetric magnetic field (δB), has been measured in KSTAR. While the application of resonant magnetic perturbation (RMP) is deemed necessary to suppress or mitigate edge-localized-mode (ELM) in ITER and future reactors, δB influence on P_{TH} in deuterium plasmas has been predicted to be mostly insensitive at low level, while linearly proportional at high level [1]. However, in similarly neutral-beam-heated deuterium plasmas, we have found that the P_{TH} of KSTAR was almost a factor of 2 lower than that of DIII-D, while revealing linear δB dependence even at its low level. Despite various differences between two devices in terms of RMP characteristics and configurations, such contrasting results are mostly attributable to an order of magnitude lower level of intrinsic error field [2] and toroidal field ripple [3] in KSTAR. Perhaps, a theory about L-H transition physics might be in better agreement with experimental results, when δB dependence is explicitly incorporated. [1] P. Gohil, et. al, Nucl. Fusion 51 103020 (2011), [2] Y. In et al, Nucl. Fusion 55 043004 (2015), [3] S.W. Yoon et al, IAEA-FEC (2014)

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