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Overview of KSTAR experimental results in 2018 campaign S. W. YOON, W. C. KIM, J. G. KWAK, J. I. CHUNG, National Fusion Research Institute, H. PARK, UNIST, KSTAR TEAM TEAM — Based on the refined control logics and detailed measurement capabilities, the KSTAR team has made significant contributions in 2018 campaign both in extending plasma performance as well as in physics understanding. KSTAR extended the pulse length of H-mode upto 90 seconds based on the previous high poloidal-beta discharges and issues for long-pulse is also investigated in terms of magnetic drift, effect of plasma shape and impurity accumulation. The fine tuning of the q-profile is also available from early diverting scheme and low/high qmin scenarios are successfully developed. The essential role of Alfven Eigen-modes in these discharges is also verified on the fast ion confinement using TRANSP, MEGA and kick-model simulations. For the ELM-crash suppression, using ECE 2-D imaging, changes of turbulent transport were observed at the transition into and out of ELM-crash suppression and the fluctuations were enhanced in the edge toward the ELM-crash suppression and at the same time, the rapid changes in perpendicular flow are synchronized. 3-D characteristics of the turbulent transport and flow near magnetic island was measured with imaging diagnostics and the fluctuation was localized near the magnetic island X-point and well reproduced with XGC1 and gKPSP gyrokinetic simulations. In addition, NTV offset toroidal rotation profile is measured with high resolution CES and compared with intrinsic rotation, and significantly greater co-Ip direction at the plasma boundary region was identified. [1] S. W. Yoon, Nucl. Fusion 51 (2011) 113009 (9pp)

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