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Research Activities on MHD and Energetic Particle Physics in KSTAR BYOUNG-HO PARK, JONG-GU KWAK, SAN-GON LEE, SI-WOO YOON, YOUNG-SUN BAE, JIN-YOUNG KIM, National Fusion Research Institute, KSTAR TEAM — In this talk, the recent achievements in MHD and energetic particle physics in KSTAR will be presented. Throughout the 2014 campaign, strategically important works in achieving KSTAR milestone including NTM stabilization, error field measurement, establishing disruption mitigation system, and identification of Alfvénic eigenmode are conducted. Real time feedback control of 2/1 NTM is successfully demonstrated with the search and suppression algorithm and the improved ECCD mirror control system. 3-D structure of n=1 intrinsic error field are fully explored with L- and H-mode plasma aiming not only to complete MID IVCC compass scan but also to set a groundwork toward understanding of KSTAR's unique feature, ELM suppression by n=1 RMP. Elaborated $q_{95} \sim 2$ discharge regime is achieved without any error field correction by virtue of the extremely low intrinsic error field of KSTAR. The integrated disruption avoidance/mitigation system for the safety secured MA-class operation is well assessed. Further investigations of the energetic particle mode have been done with various control knobs of ECH, RMP and tailoring of NBI profile and mode identification efforts have been followed. Besides high priority works above, studies on sawtooth and run-away electron have made progresses.

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