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**Steady-state ELM-suppressed H-modes from KSTAR to ITER and beyond**[1] YONGKYOON IN, J.G. KWAK, Natl Fusion Res Inst, THE KSTAR TEAM — Long-pulse, steady-state high-performance plasma is not only an important mission in KSTAR, but also directly relevant to ITER. While demonstrating the pulse-length of more than 20 sec H-mode flat-top in 2013, KSTAR has been exploring various means to achieve and sustain steady-state, ELM-suppressed/mitigated H-modes using versatile in-vessel control coils (IVCC), ECCD/ECH, and/or SMBI. In particular, taking advantage of the versatile 3-rows of IVCC, KSTAR accomplished both n=1 and n=2 RMP-driven, ELM-suppressed regimes that lasted up to 4 sec so far (limited by the discharge pulse length, not by any physics constraints, and will be extended up to 10 sec in 2014.) We also found the use of n=2 RMP has prevented a locked-mode from being disruptive (at least within the RMP phase). To cope with run-away electrons and/or off-normal events, a soft landing algorithm has been developed and confirmed capable of ramping down the plasma current safely. The enhanced understanding and demonstration of steady-state, high-performance plasmas in KSTAR will elevate the level of confidence about the success of ITER and beyond.

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