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High normalized beta plasmas exceeding the ideal stability limit and projected RWM active stabilization performance using newly installed feedback sensors in KSTAR[1] Y.S. PARK, S.A. SABBAGH, J.W. BERKERY, J.M. BIALEK, Columbia University, S.W. YOON, Y.M. JEON, J.G. BAK, W.H. KO, S.H. HAHN, C. BAE, Y.S. BAE, Y.K. IN, J. KIM, S.G. LEE, J.G. KWAK, Y.K. OH, H.K. PARK, NFRI, Korea, M.J. CHOI, G.S. YUN, POSTECH, Korea — H-mode plasma operation of KSTAR has been expanded to significantly surpass the ideal MHD no-wall beta limit by achieving normalized beta up to 4.3 while reducing plasma internal inductance to near 0.7 exceeding the computed $n = 1$ ideal no-wall limit by a factor of 1.6. These high normalized beta values have been achieved in discharges having B_T in the range 0.9-1.1 T after the plasma reached flattop current of 0.35-0.4 MA, with the highest neutral beam heating power of 4 MW. A significant conclusion of the analysis of these plasmas is that low-n global kink/ballooning or RWMs were not detected, and therefore were not the cause of the plasma termination. Advances from the 2015 run campaign aiming to achieve prolonged pulse duration at maximum normalized beta and to subsequently investigate the MHD stability of these plasmas will be reported. As KSTAR H-mode operation can now routinely surpass the ideal no-wall stability limit, $n = 1$ RWM active control is planned for the device. RWM active feedback using a newly installed set of poloidal magnetic field sensors mounted on the passive stabilizer plates and designed for optimal performance is analyzed using the VALEN-3D code. The advantages of the new sensors over other device sensors for RWM active control are discussed.

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