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Advances in pellet-fueled, improved confinement MST plasmas K.J. CASPARY, B.E. CHAPMAN, A.F. ALMAGRI, J.K. ANDERSON, D.J. CLAYTON, D.J. DEN HARTOG, F. EBRAHIMI, A.F. FALKOWSKI, G. FIKSEL, J.A. GOETZ, S. KUMAR, S.T. LIMBACH, R.M. MAGEE, M.B. MCGARRY, S.P. OLIVA, E. PARKE, J.A. REUSCH, J.S. SARFF, H.D. STEPHENS, UW-Madison, P. FRANZ, Consorzio RFX, W.F. BERGERSON, D.L. BROWER, W.X. DING, L. LIN, T. YATES, UCLA, S.K. COMBS, C.F. FAUST, ORNL — Pellet injection fueling of improved confinement MST plasmas has led to a seven-fold increase in line-averaged density with a core density now exceeding 9×10^{19} m⁻³. This has been achieved by more than doubling the size of the injected pellets, relative to previous work on MST. The improved confinement is achieved using inductive current profile control. As was previously observed at low toroidal current (0.2 MA) in MST, pellet fueling has now allowed the Greenwald density to be surpassed at high current (0.5)MA). Utilizing new Thomson scattering capability for measurement with a 2 kHz repetition rate, the central electron temperature is observed to rise from 0.4 keV to a maximum 1 keV in only a few ms after pellet ablation. Some plasmas exhibit an increased core temperature lasting longer than the nominal duration of the auxiliary inductive current drive. Work supported by DOE.

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