Abstract

Through use of x-ray arrays, highly peaked carbon (C) and molybdenum (Mo) profiles were observed to occur after pellet injection. Multi-ion neoclassical theory predicts equilibrium profiles close to these observations. Specifically, about 40 ms after pellet injection, C, a plateau impurity, was well fit by $(T_e/T_e(0))^{1.5Z_C}$ for $r<6.5$ cm ($Z_C=6$). An internal disruption then occurred, which reduced on-axis impurities by a factor of 3 and terminated the neoclassical-like transport. Based on these observations, we posit that C, the dominant non-hydrogenic contributor to $Z_{eff}$, dramatically affects sawtooth dynamics by altering the central resistivity.