Abstract Submitted
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Paleoclassical Model of Pedestal Structure[1] J.D. CALLEN, U. Wisconsin — Predictions are developed for the structure of plasma parameter profiles of H-mode pedestals in transport quasi-equilibrium in tokamak plasmas. They are based on assuming paleoclassical radial plasma transport processes dominate throughout the pedestal. The natural level of paleoclassical density transport is large in the pedestal compared to edge fueling due to neutral recycling. Thus, in this model the pedestal density profile is determined not by edge source fueling but rather by the density profile needed for the outward paleoclassical diffusive flux to be nearly balanced by the inward paleoclassical pinch flow. Specific predictions are given for the electron temperature and density gradients, profiles and magnitudes in the pedestal. The transition into ETG-driven anomalous radial electron heat transport in the core plasma determines the height of the electron pressure pedestal. Also, the profile of the toroidal plasma rotation in the pedestal is predicted. Model predictions are found to agree quantitatively (within a factor of 2) with the interpretive transport results obtained for the 98889 DIII-D pedestal [1].

[1] J.D. Callen et al., Nucl. Fusion **50**, 064004 (2010).

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