Abstract Submitted
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Combined effects of drift waves and neoclassical transport on density profiles in tokamaks W.A. HOULBERG, Oak Ridge National Laboratory, Oak Ridge, TN, P. STRAND, A. ERIKSSON, H. NORDMAN, J. WEILAND, Dept of Radio and Space Science, EURATOM/VR Association, Goteborg, Sweden — The relative importance of neoclassical and anomalous particle transport depends on the charge number of the species being studied. The detailed particle balance including the EDWM [1] drift wave model for anomalous transport that includes ITG, TEM and in some cases ETG modes, and the neoclassical model NCLASS [2], are illustrated by simulations with the DEA particle transport code. DEA models the evolution of all ion species, and can be run in a mode to evaluate dynamic responses to perturbations or to conditions far from equilibrium by perturbing the profiles from the experimental measurements. The perturbations allow the fluxes to be decomposed into diffusive and convective (pinch) terms. The different scaling with charge number between drift wave and neoclassical models favors a stronger component of neoclassical transport for higher Z impurities through the effective pinch term. Although trace impurities illustrate a simple Ficks Law form, the main ions as well as higher concentrations of intrinsic impurities exhibit non-linear responses to the density gradients as well as off-diagonal gradient dependencies, leading to a more complicated response for the particle fluxes.[1] H. Nordman, et al., Plasma Phys. Control. Fusion 47 (2005) L11. [2] W.A. Houlberg, et al., Phys. Plasmas 4 (1997) 3230.

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