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Self-heating Role for Triggering and Control of ITBS in Fusion Burning Plasmas SOMA PANTA, DAVID NEWMAN, University of Alaska Fairbanks, PAUL TERRY, University of Wisconsin Madison, RAUL SANCHEZ, Universidad Carlos III de Madrid. — In a commercial fusion reactor, self-heating is expected to be main the source of plasma heating. Auxiliary heating sources are mainly for initiation of the reaction and control of the profiles. Internal Transport Barriers(ITBs) provide one good route to developing a Steady State Tokamak Reactor(SSTR). The ability to control ITBs leads to the ability to achieve fusion criteria to get fusion energy and also the ability to clean the device by moving out the impurities accumulated at the core. Here ITBs refers to those regimes at which maximum linear growth rates are exceeded by local E X B velocity shear suppression rates and hence reduce the transport of particle and energy from core to edge. These are characterized by local reduction of transport coefficients. These barriers have a positive feedback loop in which they are created or sustained by the pressure gradient while at the same time they create or enhance those gradients in the temperature and density or pressure profiles. In this work we focus on the control of internal transport barriers in ITER parameter scenarios with auxiliary heating and proper q-profile. Then we replace much of the auxiliary heating with self-heating and fueling to control those ITBs. Some distinctions between dynamics of electron and ion ITBs are also explored.

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