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Electron and Ion Channel Transport Barriers: Initiation and Dynamical Co-evolution and their implications for burning plasmas D.E. NEWMAN, Univ. of Alaska Fairbanks, P.W. TERRY, Univ. of Wisconsin Madison, R. SANCHEZ, Universidad Carlos III de Madrid — Simple dynamical models have been able to capture much of the dynamics of the transport barriers found in many devices, however an open question has been the often disconnected nature of the electron thermal transport channel sometimes observed in the presence of a standard (“ion channel”) barrier. By adding to a simple barrier model an evolution equation for electron fluctuations we can investigate the interaction between the formation of the standard ion channel barrier and the somewhat less common electron channel barrier. Barrier formation in the electron channel is even more sensitive to the alignment of the various gradients making up the sheared radial electric field than the ion barrier is. Electron channel heat transport is found to significantly increase after the formation of the ion channel barrier but before the electron channel barrier is formed. This increased transport is important in the barrier evolution. Parameters relevant to ITER like devices will be investigated.

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