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Experimental investigation of interaction between turbulence and large-scale mode structures in HL-2A

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We present the first experimental observation of self-regulation of nonlocal transport events by NTMs generated during transient nonlocal transport events. The nonlocal effect is excited by edge cooling and propagates inward by avalanche events. These cause a local increase of the pressure gradient at the inversion surface, and thus the onset of the NTM in relatively low β plasmas. The presence of the NTM, results in the development of sheared flows at the magnetic island. These then truncate the nonlocal transport due to suppression of avalanches by shearing. These results may have important implications for the understanding of multi-scale transport dynamics, i. e., the intimate interplay between small and large scale structures.

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