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Blobs, momentum transport and tokamak rotation[1] J.R. MYRA, D.A. D'IPPOLITO, D.A. RUSSELL, Lodestar Research Corp., S.I. KRASHENINNIKOV, UCSD, B. COPPI, MIT — This paper examines how instabilities in the vicinity of the separatrix can provide a mechanism for tokamak rotation. Our hypothesis is: (i) that edge instabilities saturate by the generation of filamentary coherent structures (blobs) which convect radially outward towards the wall; and (ii) when the underlying unstable waves carry momentum (i.e. have a preferred phase velocity), the momentum is transferred to the blobs and lost from the core plasma, providing a recoil force that can rotate the core. To test these ideas, a simple two field (2D PDE) model is proposed which embodies the essential features of collisionless electrostatic drift wave instability and curvature-driven blob transport in the separatrix layer. The model has sub-limits which reduce to the Hasegawa-Mima equation, and the blob propagation equation. Progress in understanding blob generation and the transport of momentum in this system using analytical and numerical methods will be reported.

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