Abstract Submitted
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The physics behind subdiffusive transport across an externally imposed sheared flow in drift-wave turbulence[1] D.E. NEWMAN, Univ. of Alaska Fairbanks, R. SANCHEZ, Oak Ridge National Lab, DEBASMITA SAMADDAR, J.N. LEBOEUF, JNL Scientific — In recent gyrokinetic simulations of ITG turbulence it has been found that radial transport ceases to behave diffusively in the presence of a radially-sheared poloidal zonal flow [1]. We have observed a similar change in the character of transport across a shear flow in numerical simulations of 2D-turbulence in slab geometry using the BETA code, on which the sheared flow has been externally imposed [2]. The slab geometry and physics simplifies the search for the physics mechanism responsible for the onset of subdiffusion. The results suggest that subdiffusion is caused by the selection of a preferred sign for the vorticity carried out by the sheared flow throughout the 2D domain. This mechanism is likely to be important in a wide variety of turbulent systems.

[1] R. Sanchez, D.E. Newman, J.N. Leboeuf, V.K. Decyk and B.A. Carreras, Physical Review Letters **101**, 205002 (2008)
[2] D.E. Newman, D. Samaddar, R. Sanchez and B.A. Carreras, in Proc. of the 35th EPS Conference on Plasma Physics, Hersonissos, 9-13 June 2008, ECA Vol. 32, p. 1.044 (2008)

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