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Momentum Transport and Stable Modes in Kelvin-Helmholtz Turbulence[1] ADRIAN FRASER, PAUL TERRY, ELLEN ZWEIBEL, MJ PUESCHEL, University of Wisconsin-Madison — Ubiquitous in astrophysical and fusion systems, where turbulent momentum transport is of interest, the Kelvin-Helmholtz (KH) instability features unstable and stable modes at the same scales. We show that KH turbulence, in keeping with recent findings for other turbulence types, can have stable modes affect transport and move systems away from the usual energy cascade through an inertial range. Using a threshold parameter, we evaluate energy transfer to stable modes and its associated impact on turbulent amplitudes and transport, demonstrating the possibility of stable-mode-regulated KH systems. A quasilinear momentum transport calculation is performed to quantify the reduction in momentum transport due to stable modes. Finally, comparisons are made to gyrokinetic simulations driven by shear flows; linearly stable companion modes are identified, and their impact on turbulence is quantified.

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