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Angular Momentum Transport in Rotating Shear Flow: Quiescence ETHAN SCHARTMAN, Princeton Plasma Physics Laboratory, MICHAEL J. BURIN, Princeton University, HANTAO JI, Princeton Plasma Physics Laboratory, JEREMY GOODMAN, Princeton University — Phenomenological arguments have been made that sub-critical turbulent transition can drive enhanced angular momentum transport in linearly stable rotating shear flows. We present the results of a search for such a sub-critical transition in a small aspect ratio, wide-gap rotating shear flow. Fine control of secondary flows induced by the axial boundaries is obtained using two pairs of differentially rotatable end rings. The $< r - \phi >$ component of the Reynolds stress is measured using two- component Laser Doppler Velocimetry (LDV). When operating with boundary effects minimized we find no evidence of a sub- critical transition either in hysteresis of fluctuation levels or in the Reynolds stress measurement up to $Re > 10^6$. However, enhanced levels of transport are found when we choose the boundaries to mimic the configurations of previous experiments. This indicates that secondary flows have probably been responsible for observations of hysteresis and increased torque requirements.

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