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Angular Momentum Transport in Rotating Shear Flow: Turbulence MICHAEL J. BURIN, ETHAN SCHARTMAN, HANTAO JI, Princeton University — We report on experiments investigating rotating shear flow at high Reynolds numbers (10^3 – 10^6) within a wide-gap annular apparatus. For centrifugally-unstable flow regimes, the angular momentum distribution within the fluid interior is observed to be constant over radius, i.e. reset to marginal stability. Momentum transport due to turbulent fluctuations was ascertained locally using a two component synchronized LDV. The observed scaling of the transport with respect to Reynolds number is found to be consistent with datasets of torque in similar flows. We also have investigated cases where the turbulent transport is partially quenched by co-rotating the outer portion of the flow. This stabilization primarily entails a reduction of turbulent intensity; the effect upon the cross-correlation coefficient is insignificant. The similarity of these results to the suppression of turbulence in other systems, such as in rotating pipe flow, is briefly noted.

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