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Long Chain Polymers and Bubbly Drag Reduction in Taylor-Couette Flow DANIEL LANTERMAN, Institute for Research in Electronics and Applied Physics, University of Maryland, College Park 20740, THOMAS H. VAN DEN BERG, DENNIS VAN GILS, STEFAN LUTHER, DETLEF LOHSE, Department of Applied Physics, University of Twente, 7500 AE Enschede, Netherlands, DANIEL P. LATHROP, Dept. of Physics, University of Maryland — Small amounts of long chain polymers have been shown to dramatically reduce the drag of some turbulent flows. This effect is examined in a Taylor Couette apparatus ($Re = 1.4 \cdot 10^6$) instrumented to measure torque on the inner cylinder. Particular attention is paid to changes in drag reduction over time as a result of polymer degradation, and light scattering measurements are presented to quantify the change in polymer characteristics. Results are compared to drag reduction by bubble injection in the same apparatus and both methods are also examined in case of rough walls. The polymer used is polyacrylamide with mean molecular weights ranging from $8 \cdot 10^5$ to $1.8 \cdot 10^6$ Daltons. Concentrations range of 0.5 to 100 parts per million by mass.

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