

Abstract Submitted  
for the NWS05 Meeting of  
The American Physical Society

**Fractal Dimension of Experimental Time Series in Modified Taylor-Couette Flow and Non-Linear Electronic Circuits**<sup>1</sup> BRETT TOMLIN, THOMAS OLSEN, Lewis & Clark College, Portland, OR, KRISTINE CALLAN, RICHARD WIENER, Pacific University, Forest Grove, OR — Fractal Dimensions of experimental time series are calculated in terms of Correlation Dimension and Kaplan-Yorke Dimension. Numerical techniques were tested on data from a chaotic non-linear electronic circuit. Long time series were obtained from experiments in a modified Taylor-Couette fluid flow apparatus in both laminar and turbulent flow regimes. The irregular generation of Taylor Vortex Pairs in laminar Taylor-Couette flow with hourglass geometry has previously demonstrated low dimensional chaos.<sup>2</sup> The turbulent flow regime is demonstrated to have a higher, yet finite, dimension.

<sup>1</sup>This research was supported by the Rogers Science Research Program and National Science Foundation grants DMR-0241814 & DMR-0241890

<sup>2</sup>T. Olsen, R. Bjorge, & R. Wiener, Bull. Am. Phys. Soc. **47-10**, 76 (2002).

Thomas Olsen  
Lewis & Clark College

Date submitted: 11 Apr 2005

Electronic form version 1.4