

Abstract Submitted
for the DFD11 Meeting of
The American Physical Society

Spatiotemporal cascades of the Poiseuille-Hagen flow in invariant elliptic structures VICTOR MIROSHNIKOV, College of Mount Saint Vincent — Spatiotemporal cascades of the transitional Poiseuille-Hagen flow are considered in elliptic structures, which are invariant with respect to differential and nonlinear algebraic operations. Differentiation and algebra of the invariant structures and decomposition of smooth velocity profiles in the invariant structures are treated both theoretically and symbolically. Reduction of the invariant elliptic structures to invariant trigonometric structures and invariant hyperbolic structures is also considered. By using the invariant structures, the displayed and hidden perturbations of the basic Poiseuille-Hagen flow are represented as dual perturbations, while the series solution for the perturbed flow converges uniformly. The cascade solution for the Poiseuille-Hagen flow is constructed in a multiscale form, which explicitly shows the effect of various factors at multiple scales.

Victor Miroshnikov
College of Mount Saint Vincent

Date submitted: 02 Aug 2011

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