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Jeffery-Hamel flow: an experimental study of instabilities, bifurcations and multiple solutions¹ PETER VOROBIEFF, The University of New Mexico, VAKHTANG PUTKARADZE, Colorado State University — We present an experimental realization of the classical Jeffery-Hamel flows inside a wedge-shaped channel. We measure the velocity fields in the nearly-two-dimensional flow produced in our experimental apparatus, and compare the data with the predictions of Jeffery-Hamel theory. The flow is governed by two dimensionless parameters, the Reynolds number R and the wedge angle α . In the plane of these parameters, we perform a detailed study of bifurcation diagrams for the solutions that reveals the absolute stability of the pure outflow solution and an interesting hysteretic structure for bifurcations. We also observe a multiple-vortex flow regime predicted earlier numerically and analytically.

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