

Abstract Submitted
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Bifurcation phenomena in the flow through a sudden expansion in a circular pipe JAMES SEDDON, TOM MULLIN, Manchester Centre for Non-linear Dynamics, University of Manchester, UK., MICK MANTLE, ANDY SEDERMAN, Magnetic Resonance Research Centre, University of Cambridge, UK. — We report the results of an experimental investigation of laminar and time-dependent flows through a sudden expansion in a circular pipe. The flow state was investigated using high resolution MRI imaging techniques which have allowed us to settle a long standing debate on the first instability that occurs. As Re is increased, the flow passes through a steady symmetry breaking bifurcation such that the position of the recirculating eddy becomes asymmetric within the pipe. This in turn gives way to simple periodic motion via a Hopf bifurcation with further increase in Re .

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