

Abstract Submitted
for the DFD06 Meeting of
The American Physical Society

Experimental Characterization of Starting Jet Dynamics¹ CAROLINA MARUGAN-CRUZ, Universidad Carlos III de Madrid, GENO PAWLAK, University of Hawai'i at Manōa, CARLOS MARTINEZ-BAZAN, Universidad de Jaen, MARCOS VERA, Universidad Carlos III de Madrid — The dynamics of a laminar starting jet are explored in a series of laboratory experiments and numerical simulations. We identify new, objective methods for characterizing the leading vortex ring, enabling robust comparisons with results from a numerical model. Observations of circulation in the initial vortex ring and for the total jet are reported along with strain rate at the leading stagnation point. Growth and pairing of shear instabilities trailing the leading vortex ring is observed. Development of these secondary vortices and their subsequent interactions with the leading vortex has significant effects on the characteristics of the primary vortex ring. Strong fluctuations in strain rate at the leading edge are associated with the pairing of the initial vortex ring with a trailing secondary ring.

¹Support for this research was provided by the Spanish MEC and European Union under Projects #ENE2005-08580-C02-01 and DPI2005-08654-C04-01

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Date submitted: 28 Jul 2006

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