

Abstract Submitted
for the DFD12 Meeting of
The American Physical Society

Experimental Test of Revised Similarity Hypotheses without Taylor's Hypothesis JUN CHEN, DUO XU, School of Mechanical Engineering, Purdue University — Simultaneous velocity and scalar fields of a turbulent jet, measured by combined Particle Image Velocimetry (PIV) and Planar Laser Induced Fluorescence (PLIF), are used to test Refined Similarity Hypotheses (RSH) and its extension to passive scalar (RSH-P). Without introducing artificial effects introduced by Taylor's hypothesis in traditional single-point measurements, RSH is successfully validated in this study by direct examinations of its three hypotheses. However, RSH-P is partially supported, where the hypothesis of independent behavior of stochastic variable is not supported.

Duo Xu
School of Mechanical Engineering, Purdue University

Date submitted: 10 Aug 2012

Electronic form version 1.4