

14th International Flow Measurement Conference 2007 (FLOMEKO 2007)

**Sandton, Gauteng, South Africa
18-21 September 2007**

ISBN: 978-1-61567-802-0

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571
www.proceedings.com

Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2007) by IMEKO
All rights reserved.

Printed by Curran Associates, Inc. (2010)

For permission requests, please contact IMEKO
at the address below.

IMEKO Secretariat
P.O. Box 457
H-1371 Budapest
Hungary

Phone/Fax: +36 1 353 1562

imeko@t-online.hu

TABLE OF CONTENTS

Simulation of a Sonic Nozzle by a Numerical Code	1
<i>Pier Giorgio Spazzini, Orazio Caramia</i>	
Performance Test of MEMS-Fabricated Critical Flow Venturi Nozzles	11
<i>Chih-Chung Hu, Win-Ti Lin, Cheng-Tsair Yang, Wen-Jay Liu</i>	
Step-down Procedure of Sonic Nozzles Calibration.....	18
<i>Jae Myoung Lim, Bok Hyun Yun, Hae Man Choi, Kyung Am Park</i>	
The Numerical Simulation on Nozzles	24
<i>Chunhui Li, Chi Wang</i>	
Fault Detection on Turbine Flow Meters Using Time-frequency Analysis.....	32
<i>Osmel Reyes Vaillant, Jesús Cabrera Gómez</i>	
Measurement Errors Caused by Asymmetry in Electromagnetic Flow Meter	38
<i>Xiao-Zhang Zhang, Xi Li</i>	
A Novel Design of a 12 Chords Ultrasonic Gas Flow Meter, Optimized for Performance Monitoring.....	46
<i>Jan G. Drenthen, Martin Kurth, Jeroen Van Klooster</i>	
A Novel Ultrasonic Flowmeter for LNG with Fiscal Accuracy	61
<i>Jankees Hogendoorn, André Boer</i>	
Application of Ultrasonic Flow Measurement Technology to Past and Future Generations of Nuclear Power Plants.....	72
<i>Herb Estrada, Ernie Hauser, Gregor Brown</i>	
Changes in Recently Revised AGA Report No.9: Measurement of Gas by Multipath Ultrasonic Meters.....	86
<i>Ali Quraishi</i>	
Installation Effects of a Multi-path Ultrasonic Meter by Flow Simulation and Experiments.....	88
<i>Fong-Ruey Yang, Jian-Yuan Chen, Jiuun-Haur Shaw, Cheng-Tsair Yang, Jeng-Zen Fang, Ze-Wei Wang, Kun-Hai Lin, Tsai-Wang Huang</i>	
Mechanical Thermal Expansion Correction Design for an Ultrasonic Flow Meter	96
<i>Emil Martinson, Jerker Delsing</i>	
Comparisons Between Horizontally Installed Standards and Non-standard Flange Tapped Orifice Plate Meter Wet Gas Flow Responses.....	102
<i>Richard Steven, Charlie Britton, Joshua Kinney</i>	
The Performance of Flow Nozzles at High Reynolds Number	125
<i>Michael Reader-Harris, Jeff Gibson, David Hodges, Ian Nicholson, Ronnie Rushworth</i>	
New Method for the Characterization of Flow Profiles.....	138
<i>Thomas Lederer, Michael Dues, Ulrich Müller, Henri Baumann, Franz Adunka, Gudrun Wendt</i>	
Water Mass Measurement in Parts for Volume Standard Calibration in the Key Comparison	145
<i>Valter Yoshihiko Aibe</i>	
Low-speed Measurements Using a Hot-wire Anemometer	149
<i>Pier Giorgio Spazzini, Valentino Todde, Mats Sandberg</i>	
Development of a Tracer Method to Check Flow Meters in Natural Gas Based on Accurate Speed-of-Sound Determination.....	159
<i>H. J. Riezebos, G. J. Van Essen, J. P. Mulder, L. Van Luijk, M. P. Van Der Beek, S. Hagendoom, A. J. M. Herwijn, A. M. H. Van Der Veen</i>	
Model-based Fluid Diverter Analysis for Improved Uncertainty Determination in Liquid Flow Calibration Facilities, Exemplified with PTB's "Hydrodynamic Test Field"	188
<i>Rainer Engel, Hans-Joachim Baade</i>	
A Specification and Uncertainty Evaluation of a High Reynolds Number Calibration Facility	200
<i>Noriyuki Furuichi, Yoshiya Terao, Masaki Takamoto</i>	
Automated Primary Flow Calibration	207
<i>Harvey Padden</i>	
Calibration of a Cup Anemometer on a Rotating Arm Rig	222
<i>Riccardo Malvano, Pier Giorgio Spazzini, Aline Piccato</i>	
Development of a 500 SLM High Speed Piston Prover.....	228
<i>Harvey Padden</i>	
Comparison Test Between the Light Oil Flow Standard System and Calibration System by Using the Turbine Flowmeter Package.....	242
<i>Ki Won Lim</i>	
Uncertainty of the Critical Venturi Transfer Standard Unit in the K6 Gas Flow Key Comparison.....	250
<i>John D. Wright</i>	

Trilateral Comparison of Static Volume: INIMET, PTB, INMETRO	265
<i>J. Franco, A. Maury, G. Espinosa, N. Alonso, H. Többen, D. Dopheide, Dalni S. Filho, Jose J. Pinheiro</i>	
EUROLOOP: Unique Oil and Gas Calibration Facilities.....	277
<i>Wim Volmer</i>	
The Linking of the CIPM Key Comparisons CCM.FF-KC5a (for Natural Gas) and CCM.FF-KC5b (Compressed Air/Nitrogen) Using Model Based Analysis of the Data	281
<i>B. Mickan, R. Kramer, D. Dopheide</i>	
Dynamic-weighing Liquid Flow Calibration System - Realization of a Model-based Concept.....	303
<i>Jesús Aguilera, Rainer Engel, Gudrun Wendt</i>	
Development of the National Standard Facility for Hydrocarbon Flow at 0.1 to 15m³/h	317
<i>Ryouji Doihara, Takashi Shimada, Yoshiya Terao, Masaki Takamoto</i>	
Numerical Simulation of Flow in Stator of Turbine Flow Meter.....	322
<i>U. Banaszak, E. Von Lavante, K. Van Dellen</i>	
Effects of Shape Change due to Wear on the Accuracy of Vortex-shedding Flow Meters	330
<i>E. Von Lavante, U. Banaszak, M. G. Yilmaz, O. Ricken, R. Höcker</i>	
Author Index	