

ISSN 1000-1158
CODEN JIXUEU
CN11-1864/TB

计
量
学
报

JILIANG XUEBAO

ISSN 1000-1158



中国计量测试学会

计 量 学 报

第 41 卷 第 12A 期 2020 年 12 月

目 次

- 微小液体流量装置技术发展研究 刘 莉, 周 昶, 高 峰, 孟 涛 (1)
- 环道式气体流量标准装置的不确定度评估及能力验证 李春辉, 崔骊水, 王 池, 曹 鹏, 王 粟 (7)
- 流量计在线环境适应性实验系统研究 李晓鹏, 邢 超, 孟 涛 (11)
- 管道阀门对液体流动特性影响的数值研究 季杰强, 郑建英, 余松青, 吴晓杰, 程乐鸣 (16)
- 天然气能量计量不确定度评估 李春辉, 徐 明, 沈 超, 陈文琳 (22)
- 燃气表流量波动式耐久性试验装置的研制 王 卫, 夏 杰, 周唯荟 (28)
- 不同气源混气对天然气流量计量的影响分析 金钟翔, 黄冠文, 刘译文, 孙 楠, 符少权 (32)
- 充分发展状态下管道流速分布研究 蔡 勤, 刘敦利, 胡鹤鸣 (37)
- 低全球变暖潜能工质热管换热器性能及可用能分析 张仕杰, 李 准, 周 峰, 孙淑芳, 马国远 (41)
- 管输天然气能量计量发热量间接测定核查方法探讨
..... 刘 喆, 吴 岩, 蒋兴鹏, 周 阳, 宋超凡, 周振东 (47)
- 基于网状声路布置的超声流量计计量性能研究 陈 辉, 严学智 (52)
- 高压天然气条件下标准喷嘴实流标定研究 陈行川 (58)
- 不同管径下外夹式超声流量计仪表系数的实验研究
..... 许瑞祥, 姚依国, 翟恒涛, 唐法伟, 韩 明, 肖远欢, 薛 蕾 (63)
- 网络流量传输原理及其计量技术研究 杨 鲲, 崔伟群, 滕俊恒 (68)
- 凸轮轴几何量测量技术研究现状与发展 林 虎, 杨武伟, 薛 梓, 杨国梁 (76)
- 基于粒子群算法的机器人运动学参数标定研究 陈相君, 赵志方, 任国营, 栗大超, 班 朝 (85)
- 测量系统分析在粗糙度测量中的应用 黄彩清, 罗金刚 (92)
- 基于 18B20 型温度传感器检定系统的研究 武春爱, 王硕飞, 蒋 涛, 刘 宇 (96)
- 基于智能检测技术的成组砝码量值传递衡量设计研究 王连芳, 马 堃, 刘 平, 袁 欣, 张 凯 (100)
- 标准膜片的校准方法研究 柯淑婷, 柯 刚, 万丽芬, 王 丽 (106)
- 2 500 Pa 基准微压计性能优化与研究 马 可, 杨远超, 王 鹏 (110)
- 基于激光绝对法的动力调谐陀螺动态特性校准技术研究 黄相华 (116)

基于立式旋转平衡系统的惯性积测试方法研究	张磊乐, 武艺泳, 时永华 (124)
基于微纳米尺度计量测试仪器的组合弹簧断裂失效分析	唐小聪, 王珉, 郭鑫 (129)
恒定标高一等金属量器标准装置的研究	李 宁, 向德华, 周 艳 (135)
铁路罐车容积高精度自动计量系统	张志鹏, 邵学君, 庞 庆 (142)
超偏载装置计量车测量结果的不确定度评定	段小军, 李世林, 崔宝祥, 李学宝, 侯秀林 (148)
电能计量设备全性能智能检测系统设计与建设	巨汉基, 丁恒春, 祝恩国, 韩 迪, 王贵现, 崔文武, 王 晨 (155)
差阻式读数仪校准方法的研究及不确定度分析	何浩鹏, 张 鑫 (162)
反宇宙射线低本底 γ 谱仪系统的设计和建立	张朕朕, 范梓浩, 周倩倩, 梁珺成, 张 明 (167)
用于环境辐射监测的高气压电离室性能研究	郭思明, 黄建微, 杨 扬 (172)
取样钢瓶对天然气中总硫含量分析结果的影响	姜 琛 (177)
GUM 法和自适应 MCM 法在海水盐度测量仪器检定装置不确定度评定中的应用分析	王朋朋, 赵士伟, 刘园园, 孟文蓉 (183)

ACTA METROLOGICA SINICA

(MONTHLY)

Vol. 41, No.12A, December 2020

CONTENTS

- Research on Technology Development of Micro Liquid Flow Facility LIU Li, ZHOU Chang, GAO Feng, MENG Tao (1)
- Uncertainty Evaluation and Capability Verification of Gas Flow Close Loop Standard Facility
..... LI Chun-hui, CUI Li-shui, WANG Chi, CAO Peng, WANG Su (7)
- Research on Online Environmental Adaptability Experiment System of Flowmeter LI Xiao-peng, XING Chao, MENG Tao (11)
- Numerical Study on The Influence of Pipeline Valves on Liquid Flow Characteristics
..... JI Jie-qiang, ZHENG Jian-ying, YU Song-qing, WU Xiao-jie, CHENG Le-ming (16)
- Uncertainty Evaluation of Natural Gas Energy Measurement LI Chun-hui, XU Ming, SHEN Chao, CHEN Wen-ling (22)
- Development of Gas Meter Flow Fluctuation Durability Test Device WANG Wei, XIA Jie, ZHOU Wei-hui (28)
- Analysis of Influence of Different Gas Source Mixture on Natural Gas Flow Measurement
..... JIN Zhong-xiang, HUANG Guan-wen, LIU Yi-wen, SUN Nan, FU Shao-quan (32)
- Study on Velocity Distribution of Pipeline under Fully Developed Condition CAI Qin, LIU Dun-li, HU He-ming (37)
- Analysis and Evaluation of Heat Pipe Heat Exchanger's Performance with Low Global Warming Potential Refrigerant
..... ZHANG Shi-jie, LI Zhun, ZHOU Feng, SUN Shu-fang, MA Guo-yuan (41)
- Study on Verification Method of Metering Calorific Value of Pipeline Natural Gas
..... LIU Zhe, WU Yan, JIANG Xing-peng, ZHOU Yang, SONG Chao-fan, ZHOU Zhen-dong (47)
- Research on Measurement Performance of Ultrasonic Flowmeter Based on Reticulated Acoustic Path Arrangement
..... CHEN Hui, YAN Xue-zhi (52)
- Real Flow Calibration of Standard Nozzles Under High Pressure Natural Gas CHEN Xing-chuan (58)
- Experimental Study on Meters Factor of Clamp-on Type Ultrasonic Flowmeter with Different Pipe Diameters
..... XU Rui-xiang, YAO Yi-guo, ZHAI Heng-tao, TANG Fa-wei, HAN Ming, XIAO Yuan-huan, XUE Lei (63)
- Research on Network Traffic Transmission Principle and Measurement Technology
..... YANG Kun, CUI Wei-qun, TENG Jun-heng (68)
- Research Status and Development of Camshaft Geometrical Parameters Measurement Technology
..... LIN Hu, YANG Wu-wei, XUE Zi, YANG Guo-liang (76)
- Research on Robot Kinematics Parameter Calibration Based on Particle Swarm Optimization
..... CHEN Xiang-jun, ZHAO Zhi-fang, Ren Guo-ying, LI Da-chao, BAN Zhao (85)
- The Application of MSA in Roughness Measurement HUANG Cai-qing, LUO Jin-gang (92)
- Study on Temperature Sensor Verification System Based on 18B20
..... WU Chun-ai, WANG Shuo-fei, JIANG Tao, LIU Yu (96)
- Research on Measurement Design of Group Weight Value Transfer Based on Intelligent Detection Technology
..... WANG Lian-fang, MA Kun, LIU Ping, YUAN Xin, ZHANG Kai (100)
- Research on Calibration Method of Standard Diaphragm KE Shu-ting, KE Gang, WAN Li-fen, WANG Li (106)

Improvement of the 2 500 Pa Reference Micromanometer	MA Ke, YANG Yuan-chao, WANG Peng (110)
Research on Dynamic Calibration of Dynamically Tuned Gyro Based on Laser Interferometry	HUANG Xiang-hua (116)
Research on the Method of Measuring Inertial Product Based on Vertical Rotating Balance System	ZHANG Lei-le, WU Yi-yong, SHI Yong-hua (124)
Fracture Failure Analysis on Combined Spring Based on Micro and Nanometer Measurement Instrument	TANG Xiao-cong, WANG Min, GUO Xin (129)
Research on the Standard Device of First-class Metal Tank by Constant Elevation	LI Ning, XIANG De-hua, ZHOU Yan (135)
High Precision Automatic Measurement System for Volume of Railway Tanker	ZHANG Zhi-peng, SHAO Xue-jun, PANG Qing (142)
Uncertainty Evaluation on the Metrology Vehicle of Detecting Device for Overload and Unbalance Load	DUAN Xiao-jun, LI Shi-lin, CUI Bao-xiang, LI Xue-bao, HOU Xiu-lin (148)
Design and Construction of Full Performance Intelligent Testing System for Electric Energy Metering Equipment	JU Han-ji, DING Heng-chun, ZHU En-guo, HAN Di, WANG Gui-xian, CUI Wen-wu, WANG Chen (155)
Study on Calibration Method of Differential Resistor Reading Instrument and Uncertainty Analysis	HE Hao-peng, ZHANG Xin (162)
Design and Establishment of Anti-cosmic Ray Low Background Gamma Spectrometer System	ZHANG Zhen-zhen, FAN Zi-hao, ZHOU Qian-qian, LIANG Jun-cheng, ZHANG Ming (167)
Study on the Performance of High-pressure Ionization Chamber for Environmental Radiation Monitoring	GUO Si-ming, HUANG Jian-wei, YANG Yang, LI De-hong (172)
Influence of Sampling Steel Cylinder on Analysis Results of Total Sulfur Content in Natural Gas	JIANG Chen (177)
Application Analysis of GUM Method and Adaptive MCM Method in Uncertainty Evaluation of Seawater Salinity Measuring Instrument Calibration Device	WANG Peng-peng, ZHAO Shi-wei, LIU Yuan-yuan, MENG Wen-rong (183)