

## 基于LS-SVM的多传感器气体质量流量测量

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摘要:

针对流量测量中流速分布不规则对气体流量测量精度的影响, 提出了一种多传感器气体质量流量测量新方法。该方法基于均速管测量原理, 在测量管道中按照对数线性法分布了4个热式气体流量传感器, 采集不同特征位置的流量。通过流量标定实验, 获得不同质量流量下测量管道内4个传感器的电压。然后利用GA和LS-SVM算法, 将传感器电压和气体的质量流量作为训练集, 建立了气体流量模型。实际测量中由4个传感器的电压计算出气体的质量流量。不规则流场的流量实验结果表明该方法是有效的。

关键词: 多传感器, 质量流量, 对数线性法, 最小二乘支持向量机, 遗传算法

## The Gas Mass Flow Measurement base on Multi-sensor and LS-SVM

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**Abstract:**

a new multi-sensor method is proposed for the gas mass flow measurement in the disorder flow field of the pipeline. The method principle is based on the averaging pitot flowmeter. Four thermal flow sensors are distributed in the pipeline according to the Log-linear method in order to acquire the flowrate of different characteristic point. Through the calibration test, the voltage of the sensors is obtained at different mass flowrate. From these data, the gas mass flow model is established based on GA and LS-SVM. In the measurement process, the mass flow is computed using the model. The experiment reseach show the mesurement is valid.

**Keywords:** multi-sensor, mass flow, Log-linear method, LS-SVM, GA

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