

## 基于狭缝文丘里管的气液两相流测量

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摘要:

提出了一种新的气液两相流测量系统—狭缝文丘里管气液两相流测量系统。理论分析表明, 狭缝文丘里管利用对称结构可以减小或消除摩擦阻力的影响, 中间狭缝处垂直于水平流向的重位压降的测量同样避免了沿程摩擦阻力的影响。提出了基于狭缝文丘里管测量系统的气液两相流非分离测量方案, 并进行了实验研究。利用狭缝文丘里管重位压降信号在三类流动下的特性, 可以直接识别流型, 在不同的流型下用相应的测量模型求解气液两相的流量。结果表明该方法是可行的。

关键词: 气液两相流, 狭缝文丘里管, 加速压降, 摩擦阻压降, 重位压降

## Gas-liquid Two-phase Flow Measurement Based on A Slot Venturi

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**Abstract:**

In this study, a new gas-liquid two-phase flow measurement system based on a slot Venturi device was presented. Theoretical analysis shows that the effect of the frictional pressure drop on flow measurement can be reduced with a symmetrical structure; the effect of the frictional resistance can be eliminated by measuring the gravity pressure drop which is vertical to the flow direction in the slot segment. Furthermore, a non-diverter metering program based on the slot Venturi was implemented, and two-phase flow measurement with flow pattern identification was investigated through experiments. Three types of flow patterns were identified with time-averaged signals of the gravity pressure drop; the gas and liquid flow rate can be obtained from different measurement models under different flow patterns. The results show that this method was feasible.

**Keywords:** Gas-liquid two-phase flow, Slot Venturi, Acceleration pressure drop, Frictional pressure drop, Gravity pressure drop

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