

基于MEMS的固态风速风向传感器及其最优结构参数

作者: 杨帆, 赵湛, 杜利东

单位: 中国科学院电子学研究所

基金项目:

摘要:

基于圆柱绕流的理论分析给出圆柱体周边压强分布方程, 并据此提出了一种新型的基于MEMS的固态风速风向传感器结构。建立了其内部流体流动的理论模型利用该模型进行数值计算得到了这种传感器的最优结构参数。分析表明, 利用相互正交的MEMS风速传感器测量风向是可行的, 并且具有多个通风孔结构的传感器可以有更高的精度。

关键词: 物理量传感器, 结构参数, 圆柱绕流, 风速风向传感器, MEMS

physical sensor, structural parameter, column circuitous flow, wind velocity-direction sensor, MEMS

Author's Name:

Institution:

Abstract:

Based on the theoretical analysis of column circuitous flow, the pressure distribution equation around the column was achieved, and a novel MEMS-based solid state wind velocity and direction sensor structure was developed. The theoretical model of internal flow was established and the sensor's best structural parameter was calculated. Analysis shows that it is feasible to measure the direction of the wind by perpendicularly encapsulating with MEMS wind velocity sensor, and the sensor with multi-channel structure has a characteristic of higher precision.

Keywords: MEMS, solid state wind velocity-direction sensor, column circuitous flow

投稿时间: 2010-08-24