

[1]秦伟,苑伟政,常洪龙,等.基于模糊逻辑的MEMS陀螺零漂温度补偿技术[J].弹箭与制导学报,2011,6:19-22.

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## 基于模糊逻辑的MEMS陀螺零漂温度补偿技术(PDF)

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Title: Research on Temperature Compensation for MEMS Gyroscope Bias Drift Based on Fuzzy Logic

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摘要: 针对MEMS陀螺在外界温度变化时,角速率输出误差较大且为非线性的特点,设计了一种基于模糊逻辑的MEMS陀螺温度补偿方法,采用一元Takagi-Sugeno模糊模型对陀螺零漂的温度误差进行辨识与实时补偿,并就陀螺在自身发热和外界温度变化两种情况下的补偿效果进行了实验验证,结果表明,经过温度补偿,陀螺零漂从 $0.01003^{\circ}/s$ 减小到 $0.007^{\circ}/s$ ,可满足工程应用的需要。

Abstract: According to the fact the output error of angular rate of MEMS gyroscope is nonlinear and fluctuates dramatically with the change of environmental temperature, a temperature compensation method based on fuzzy logic has been presented, in which the unitary Takagi-Sugeno fuzzy logic model is adopted for identifying the error model of the gyro bias drift and compensating the error in real time. The effectiveness of the method has been validated by experiments under two different conditions: the one is the rising of external temperature, and the other is when the gyro is working and heating itself. The results show that the bias stability of MEMS gyroscope can be reduced from  $0.01003^{\circ}/s$  to  $0.007^{\circ}/s$  can meet the need of engineering.

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