

振动式微机械陀螺驱动环路数字AGC研究

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摘要:

对微机械陀螺系统的自激驱动环路进行了分析, 并对数字处理电路中自动增益控制 (AGC) 模块进行了深入研究, 给出了一种高控制精度的定点数字AGC算法。通过理论分析和模型仿真, 结果表明AGC控制精度得到很大的提高, 对陀螺驱动输出信号的幅度具有很好的控制效果, 从而可以大大减小陀螺温漂及其他一些因素引起的不稳定性。最后给出了算法的直线逼近近似实现方法, 能在的定点DSP当中很方便的实现。

关键词: 微机械陀螺, AGC, 自激驱动环路, 控制精度

Analysis on digital AGC of MEMS gyro driven-loop circuit

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Abstract:

This paper presents a digital AGC of high control-precision, which is applied in the driven-loop of vibrating MEMS gyroscope. The vibrating amplitude stability of the mass in driven mode affects the precision and stability of the angle-velocity detection in the Vibrating MEMS gyroscope. A new digital AGC algorithm is proposed in order to improve the stability of driving mode amplitude, and examined in the end. Its controlling precision is improved much higher than the one before and performances effectively in stability and precision of the driving loop circuit.

Keywords: MEMS gyroscope, digital automatic gain control (AGC), driven-loop circuit, control precision

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