Automated MEMS Gyroscope Characterization

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Abstract

The continuing advancement of the MEMS micro-gyroscope program at the Jet Propulsion Laboratory has necessitated the improvement of the development and test cycle. The time consuming task of manually testing and characterizing the completed device and supporting electronics as a package, has been eliminated by the development of an automated test system.

A personal computer based test system was designed and built using off-the-shelf data acquisition and measurement equipment. Custom software, developed in-house, handles system control, data acquisition, analysis and logging. Rotational response and short term stability analysis is the focus of the system. Drift stability, Green chart analysis, power spectral density (PSD) analysis, n-th order data correction on any acquired data set (i.e. drift stability or frequency measurements corrected by temperature), and turn-on stability are currently supported by the test software.

Multiple signals can be acquired and analyzed from each device; multiple devices can be tested simultaneously. Current hardware allows for analog, digital, IEEE 488, and temperature signal measurements. The system generality also allows for the testing of different types of inertial units (i.e. accelerometers).

This automated test system provides a cost effective and efficient method of characterizing inertial devices.

Suggested Track: **13.4 Testing For The 21st Century Systems**
- or -
12.2 Technologies, Tools, and Applications

Word Count: 191

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