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II. System Description

III. Experimental Results

IV. Conclusion

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Abstract: This paper presents a solution to improve the performance of a micro electro-mechanical system (MEMS) accelerometer exploring oversampling and sensor fusion techniques. The proposed solution seems to be adequate for any measurement application that requires sensor fusion of two quantities, acceleration and temperature. The measurement system includes auto-calibration (AC) routines and software modules (SM) to evaluate noise level amplitude for self-dithering data processing and to improve the measurement reliability using self-testing techniques.

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☰ Contents

I. Introduction

The sensors based on MEMS are generally less accurate but their size is small, their weight is low and, above all, they represent a low-cost solution with potential advantages in many applications. This paper presents an interesting solution to improve MEMS accelerometers performance using smart sensing techniques [1]. Special attention is dedicated to almost static measurements (e.g.: gravity) where disturbances caused by external effects, like vibrations, can affect substantially the measurement's system accuracy.

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