

## Highly Linear and Low Noise AMR Sensor Using Closed Loop and Signal-Chopped Architecture

**Authors :** N. Hadjigeorgiou, A. C. Tsalikidou, E. Hristoforou, P. P. Sotiriadis

**Abstract :** During the last few decades, the continuously increasing demand for accurate and reliable magnetic measurements has paved the way for the development of different types of magnetic sensing systems as well as different measurement techniques. Sensor sensitivity and linearity, signal-to-noise ratio, measurement range, cross-talk between sensors in multi-sensor applications are only some of the aspects that have been examined in the past. In this paper, a fully analog closed loop system in order to optimize the performance of AMR sensors has been developed. The operation of the proposed system has been tested using a Helmholtz coil calibration setup in order to control both the amplitude and direction of magnetic field in the vicinity of the AMR sensor. Experimental testing indicated that improved linearity of sensor response, as well as low noise levels can be achieved, when the system is employed.

**Keywords :** AMR sensor, closed loop, memory effects, chopper, linearity improvement, sensitivity improvement, magnetic noise, electronic noise

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