CO-rich amorphous wire study for GMI micro geomagnetic sensors

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Abstract: In this paper, a kind of micro geomagnetic sensor is researched due to the giant magneto-impedance (GMI) effect of Co-rich amorphous wires. It is proposed a multivibrator bridge should be adopted as the structure module, which can realize the circuit's auto excitation. In sequence, the measuring principle of the sensor is intensively analyzed by establishing the mathematic model, which illustrates this sensor is a linear one. In addition, a signal processing system that includes differential circuit, low pass filter, amplifier circuit, CPUSCM, A/D conversion circuit and LED are introduced. The scheme shows that the sensitivity of this sensor can reach lager than 28mv/Oe by choosing appropriate parameters of the modules, and the calculated field error closes to 1.8%. This sensor is proved to be feasible for measuring weak signal of geomagnetic field, and it can greatly benefit further development of the geomagnetism-aided navigation.

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