Theoretical studies on amorphous wire sensor and its application for AHRS

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Abstract: The theoretical study due to the giant magnetoimpedance (GMI) effect of Co-rich amorphous wire sensor is presented. As a practical device, this sensor may be used to sense the Earth's magnetic field and to provide a measure of the attitude of a moving vehicle. It is proposed a multivibrator bridge should be adopted as the structure module. The measuring principle of the sensor is stressed, which is accomplished by means of establishing corresponding mathematic model. In sequence, with a numerical simulation being carried out, a good linear characteristic between voltage and measured field in the range of ±3Oe is achieved, which demonstrates this sensor is a linear one, and it is capable of measuring weak signal of magnetic field. In addition, the application of this sensor for the attitude and heading reference system (AHRS) with the micro inertial measurement unite (MIMUs) is studied, providing an effective method for low cost solid-state AHRS with high accuracy theoretically.
Author Keywords: AHRS; Amorphous wire; Geomagnetic sensor; GMI effect MEMs

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