Triaxis Magnetoresistive (MR) sensor using permalloy plate of distorting magnetic field

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Abstract: This paper proposes a triaxis magnetoresistive (MR) sensor of detecting not only x- and y-axes magnetic field intensities but also z-axis one, where all fields are based on the sensor coordinate system. Namely, not only azimuth but also angle of elevation of the sensor can be detected from triaxis components of geomagnetic field. The principle is as follows: a permalloy (FeNi) plate is stood aside MR element. The plate distorts magnetic field and generates x- (or y-) component from originally z-directional field. So, the resistance of MR element changes in proportional to z-axis field intensity, provided that other axes intensities are kept constant. By contriving a processing circuit, three axes components can be separately detected. ©2010 IEEE.

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