MAGNETIC FIELD SENSING PROPERTIES OF TUNNEL MAGNETORESISTANCE DEVICES WITH PERPENDICULAR ANISOTROPY

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9.7 cm

Sensing characteristics; sensitivity, nonlinearity and hysteresis of exchange biased tunnel magnetoresistance (TMR) devices with out-of-plane magnetization in CoFeB sensing layer were studied. The perpendicular magnetization of the layer was achieved by thinning CoFeB. The devices show bipolar and unipolar resistance versus magnetic field curves for magnetic field applied in-plane and out-of-plane, respectively. For both field configurations devices with hysteresis below 1% of the full scale (FS) and linearity below 1% FS were demonstrated. The sensing characteristics of the devices depend on CoFeB electrodes thickness. The sensitivity and hysteresis increase with increasing CoFeB electrode thickness. The TMR devices with perpendicular anisotropy show potential for sensing magnetic field with good linearity, ultra low hysteresis and variable sensing range. **Acknowledgments:** This work was supported by National Science Centre grant. WS thanks the Foundation for Polish Science MPD Programme cofinanced by the EU European Regional Development Fund. We thank Singulus Technologies AG for samples deposition.

13.4 cm

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