

# Magnetic field sensor based on magnetic tunnel junction with voltage tunable magnetic anisotropy

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Measurement of ultra low magnetic fields is an important issue in many medical and technical applications. Specially designed magnetic tunnel junction (MTJ) is very promising candidate for low magnetic field sensor. We show experimental data on CoFeB(1.35 nm)/MgO(2 nm)/CoFeB(2.5 nm) MTJ with an elliptical shape of 120 x 230 nm. Taking advantage of perpendicular interface magnetic anisotropy (PMA), we tuned the thicknesses of both layers to achieve orthogonal magnetization alignment between perpendicular free layer (FL) and in-plane reference layer. Next, by reversing the bias voltage applied to the MTJ we influence the PMA of the FL and, therefore, affect the sensitivity curve [W. Skowroński et al. APL 101, 192401 (2012)]. The change of the linear operating range from 10 to 60 Oe and the sensitivity from 0.49%/Oe to 0.056%/Oe was measured.

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