Exchange-biased planar Hall effect sensor optimized for biosensor applications - DTU Orbit

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This article presents experimental investigations of exchange-biased Permalloy planar Hall effect sensor crosses with a fixed active area of $w \times w = 40 \times 40 \mu m^2$ and Permalloy thicknesses of $t = 20$, 30, and 50 nm. It is shown that a single domain model describes the system well and that the thicker film will have a higher signal as well as a lower noise. It is estimated that the signal-to-noise ratio for bead detection increases by a factor 2.1 when $t$ is increased from 20 to 50 nm and hence a higher $t$ is beneficial for biosensor applications. This is exemplified with calculations on M-280 Dynabeads (R).

General information
State: Published
Organisations: Magnetic Systems Group, LabChip Section, Department of Micro- and Nanotechnology
Contributors: Damsgaard, C. D., Freitas, S., Freitas, P., Hansen, M. F.
Pages: 07A302
Publication date: 2008
Peer-reviewed: Yes

Publication information
Journal: Journal of Applied Physics
Volume: 103
Issue number: 7
ISSN (Print): 0021-8979
Ratings:
BFI (2019): BFI-level 1
Web of Science (2019): Indexed yes
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 2.03 SJR 0.739 SNIP 0.953
Web of Science (2017): Impact factor 2.176
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 1.72 SJR 0.906 SNIP 0.977
Web of Science (2016): Impact factor 2.068
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 1.57 SJR 0.821 SNIP 0.996
Web of Science (2015): Impact factor 2.101
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): CiteScore 2.04 SJR 1.039 SNIP 1.197
Web of Science (2014): Impact factor 2.183
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 2.24 SJR 1.155 SNIP 1.286
Web of Science (2013): Impact factor 2.185
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): CiteScore 2.13 SJR 1.312 SNIP 1.291
Web of Science (2012): Impact factor 2.21
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): CiteScore 2.24 SJR 1.374 SNIP 1.3
Web of Science (2011): Impact factor 2.168