Nonadiabatic Spin Torque Investigated Using Thermally Activated Magnetic Domain Wall Dynamics - DTU Orbit (09/02/2019)

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Using transmission electron microscopy, we investigate the thermally activated motion of domain walls (DWs) between two positions in Permalloy (Ni80Fe20) nanowires at room temperature. We show that this purely thermal motion is well described by an Arrhenius law, allowing for a description of the DW as a quasiparticle in a one-dimensional potential landscape. By injecting small currents, the potential is modified, allowing for the determination of the nonadiabatic spin torque: $\beta_t = 0.010\pm0.004$ for a transverse DW and $\beta_v = 0.073\pm0.026$ for a vortex DW. The larger value is attributed to the higher magnetization gradients present.

General information
State: Published
Organisations: Center for Electron Nanoscopy
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Pages: 056601
Publication date: 2010
Peer-reviewed: Yes

Publication information
Journal: Physical Review Letters
Volume: 105
Issue number: 5
ISSN (Print): 0031-9007
Ratings:
BFI (2019): BFI-level 2
Web of Science (2019): Indexed yes
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Scopus rating (2017): CiteScore 7.58 SJR 3.622 SNIP 2.464
Web of Science (2017): Impact factor 8.839
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 6.33 SJR 4.196 SNIP 2.61
Web of Science (2016): Impact factor 8.462
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): CiteScore 5.76 SJR 4.656 SNIP 2.538
Web of Science (2015): Impact factor 7.645
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): CiteScore 6.62 SJR 5.232 SNIP 2.71
Web of Science (2014): Impact factor 7.512
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): CiteScore 7.46 SJR 5.675 SNIP 2.781
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): CiteScore 7.19 SJR 6.292 SNIP 2.867
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): CiteScore 7.02 SJR 6.314 SNIP 2.905
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2