Spin waves in waveguide with zig-zag antidot pattern

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We considered[1] the planar magnonic waveguide with a periodic sequence of antidots forming zig-zag pattern, where two neighboring antidots are shifted towards the opposite edges of the waveguide. We have shown that new frequency gaps can be opened due to the complex base of the system and their width can be controlled by the shift of the antidots. We found that, the different strength of spin wave pinning at the edges of the periodic waveguide (and their antidots) determines the dependence of the width of gap on the shift of antidots. We indentified an optimum shift of antidot for maximzing the width of the gap for the system with pinned magnetization. We noticed that for this kind of geometry of the waveguide, the majority of the modes are doubly degenerate at the edge of Brillouin zone and have a non-zero group velocity at the very close vicinity of the edge of Brillouin zone, for larger values of antidot shift.

References:

[1] S. Pan, J. W. Kłos, S. Mieszczak, A. Barman, M. Krawczyk, https://arxiv.org/abs/1702.04667v2

This work was supported by grants: Indo-Polish Project - DST/INT/POL/P-11/2014, NSC Poland grant - UMO-2012/07/E/ST3/00538, Eus Horizon2020 gran - GA No. 644348(MagIC), Govt. of India for INSPIRE fellowship.