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**Spin waves propagation in structured magnetic films with perpendicular magnetic anisotropy** CODY KELLOGG, KASUNI NANAYAKKARA, ALEXANDER KOZHANOV, Georgia State University — Spin wave based signal processing and logic devices have a long history of development and exploration. Typically, structures with in-plane magnetization are used. The shape and dimensions of the structures define the spin wave dispersion. It was shown that spin wave propagation in complex structures like spin waveguide bends, T-, Y- and cross junctions is strongly dependent on the spin wave mode coupling between different parts of the structure. Spin wave scattering and interference processes define the wave propagation in these structures. In this work we perform numeric simulations to investigate spin wave propagation in structures based on magnetic films with perpendicular magnetic anisotropy (PMA). We analyze spin wave propagation in spin waveguide bends, T, and cross junctions while varying their dimensions. We demonstrate that forward volume magnetostatic spin wave modes supported by films with PMA can propagate in complex structures with geometry-controlled scattering. We show that varying a uniform out-of-plane external magnetic field results in the spin wave frequency shift while not affecting the overall wave propagation. We analyze local standing spin wave modes and discuss the structure shape variation effect on the wave propagation.

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