

Influence of focused Ga^+ beam in CoFeB/Au layers: Interplay with perpendicular magnetic anisotropy and DMI

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Recent research focusing on controlling and investigating the properties of propagating spin waves in ultrathin ferromagnetic layers has garnered significant attention owing to its promising implications for future nanoscale magnetic devices. The ability to manipulate spin wave characteristics using a focused Ga^+ beam (FIB) on Au/CoFeB/Au layers across varying fluences holds considerable importance in terms of potential applications. In this study, we present experimental findings regarding spin wave propagation in layers with tailored magnetic properties under the influence of the Ga^+ beam. Using Brillouin light scattering spectroscopy, we quantified the frequency of magnon waves as a function of wavevector and complemented our analysis with ferromagnetic resonance measurements to further characterise the sample. Through analysis of spin wave dispersion profiles, we showcase the correlation between magnon frequencies and the Ga^+ dose. Additionally, we investigate the impact of Ga^+ on magnetic anisotropy and Dzyaloshinskii-Moriya interaction. Our findings indicate that the examined sample displays promising characteristics. These results underscore the potential of CoFeB layers for advancing research and future applications in the field of magnonics.

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