Spin wave dynamics in double CoFeB/Au layers

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Magnonics is a research field which concentrate on the study of spin wave dynamics and their applications. In a few kind of magnetic materials, perpendicular magnetic anisotropy can exist. This area of research has attracted a significant amount of interest because, possibility of implication for the new generation magnetic recording devices. One of the materials which possess PMA effect is CoFeB thin films. Such effect is observable for thin layers of CofeB. Here, the experimental studies of PMA in CoFeB thin films will be presented. Also, the existence of nontrivial magnonic band structure will be shown. For the thin films, the magnetic properties strongly depends on the thickness of the film. Increasing the thickness of studied magnetic material, results disappearance of PMA effect. In presented results, we employed Brillouin Light Scattering (BLS) method to quantify energy of magnons in thin film samples composed of magnetic (CoFeB) and non-magnetic (Au) layers deposited on Si substrate. Spin wave dispersion relations were extracted and studied the nonlinear effect as well as system behaviour as the function of thickness of magnetic film. The dispersion relations show anomalous characteristics.

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