Abstracts

MSSW and MSVW in a Multilayered Ferrimagnetic Structure with an Arbitrary Orientation Between Two Static Magnetizations

K. Sun. "MSSW and MSVW in a Multilayered Ferrimagnetic Structure with an Arbitrary Orientation Between Two Static Magnetizations." 1993 Transactions on Microwave Theory and Techniques 41.6 (Jun./Jul. 1993 [T-MTT]): 1143-1148.

This paper presents a study of both magnetostatic surface wave (MSSW) and magnetostatic volume wave (MSVW) propagation in multilayered magnetic thin films with noncollinear magnetizations. YIG/GGG/YIG structure is used, where YIG and GGG are the abbreviations for yttrium iron garnet and gadolinium gallium garnet, respectively. The layered film is in the (110) plane. Due to the existence of both cubic and induced in-plane uniaxial anisotropy fields in the two YIG films, the two magnetizations (/--> over M//sub 1/ and /--> over M//sub 2/) are not aligned with the applied dc field. Since there is an arbitrary angle between /--> over M//sub 1/ and /--> over M//sub 2/, there is a new configuration to study both MSSW and MSVW propagations. The interested MSVW propagation in the plane formed by /--> over M//sub 1/ and /--> over M//sub 2/ shows a different dispersion relationship from that in the direction perpendicular to the plane formed by /--> over M//sub 1/ and /--> over M//sub 2/. For a given applied dc field normal to the film plane, MSVW is excited in the /--> over M//sub 2/ layer, while MSSW is excited in the /--> over M//sub 1/ layer. We have found that the angle between the two static magnetizations strongly affects the dispersion relationship. In addition, the effect of the separation between the two magnetic layers on the dispersion and time delay has been studied.

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