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Spin Wave Propagation in an Yttrium Iron Garnet Film in an Out-of-Plane Magnetic Field[1] WONBAE BANG[1], JINHO LIM[1], JONATHAN TROSSMAN[1], [1]Department of Physics and Astronomy, Northwestern University, Evanston, IL 60208, C. C. TSAI[2], [2]Department of Engineering Management of Advanced Technology, Chang Jung Christian University, Tainan, 71101, Taiwan, J. B. KETTERSON[1,3], [3]Department of Electrical and Computer Engineering, Northwestern University, Evanston, IL 60208 — We have studied the propagation of spin waves in a (111) thin film of Yttrium Iron Garnet (YIG) for magnetic fields inclined with respect to the plane of the sample. Waves are generated by a wire running parallel to one edge of the film and detected by a second wire positioned at the opposing edge of the film, which has been cut parallel to the first. By studying the evolution of the phase of the received signal with magnetic field one can determine frequency vs. wavevector relation, $\omega = \omega(k)$, of various propagating modes in the film. Data were taken with the magnetic field, **H**, lying in two principle planes. For the first **H** lies in the plane defined by the direction of **k** and the plane normal, with limiting forms corresponding to the backward (BV) and forward volume (FV) modes. The second principle plane is that for which **H** is perpendicular to **k** with the limiting forms corresponding to the Damon-Eshbach (DE) and FV modes. In the DE and FV regimes avoided crossings are encountered when the propagating mode intersects the higher, exchange split, volume modes, leading to an extinction of the propagating mode; analysis of the resulting behavior allows a determination of the exchange parameter.

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