Abstracts

High Power Ferromagnetic Resonance at X-Band in Polycrystalline Garnets and Ferrites

J.J. Green and E. Schlomann. "High Power Ferromagnetic Resonance at X-Band in Polycrystalline Garnets and Ferrites." 1960 Transactions on Microwave Theory and Techniques 8.1 (Jan. 1960 [T-MTT]): 100-103.

Resonance experiments have been performed at X-band on spherical samples of polycrystalline yttrium garnet, yttrium-gadolinium garnet, yttrium-holmium garnet and nickel-cobalt ferrite. The RF field strength extended up to 60 Oersted. In the case of yttrium garnet the samples differed considerably in density and hence in Iinewidth. At fairly low power levels the susceptibility at resonance varies linearly with the square of the RF magnetic field strength. At high power levels the susceptibility is inversely proportional to the amplitude of the microwave magnetic field. The "spin-wave Iinewidth" Delta H/sub k/ is inferred by extrapolation from the behavior at very high powers. It is found that Delta H/sub k/ is, to a large extent, independent of the Iinewidth Delta H/sub k/ observed by the usual low power experiments. In particular Delta H/sub k/ was found to be essentially the same (approximately 4 Oe) for all yttrium iron garnets (single crystals and polycrystals with linewidth varying between 1.8 Oe and 450 Oe). On the other hand, Delta H/sub k/ increases very rapidly if the yttrium is partially substituted by holmium (Delta H/sub k/~11 Oe for 1 per cent substitution.)

❑ Return to main document.