Abstracts

Temperature Stabilization of Gyromagnetic Couplers (Correspondence)

J. Clark, J. Brown and D.E. Tribby. "Temperature Stabilization of Gyromagnetic Couplers (Correspondence)." 1963 Transactions on Microwave Theory and Techniques 11.5 (Sep. 1963 [T-MTT]): 447-449.

A gyromagnetic coupler using a single-crystal YIG sphere as a coupling element suffers from two significant sources of temperature instability. One of these is anisotropy drift, a characteristic that is internal to the coupling element, since it stems directly from temperature induced variations in crystalline anisotropy. The other is appropriately characterized as external; it derives from temperature induced variations in the magnetic biasing source. Either or both of these variations will result in a change in the resonant frequeucy of a gyromagnetic coupler. The 3-db bandwidth of a low loss YIG coupler may be of the order of 40 Mc, hence a change in resonant frequency of as little as 5 Mc will be detected as an increase in insertion loss at the original frequency, It is therefore quite desirable that the variations which contribute to this instability be reduced to a minimum. Means have been developed for eniminating both of these instabilities, thus rendering the gyromagnetic coupler a much more practical device under a variety of environmental conditions.

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