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DETERMINATION OF MAGNETIC ENERGY OF LITHIUM FERRITE USING HEISENBERG HAMILTONIAN

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The classical Heisenberg Hamiltonian was solved for ordered Lithium ferrite thick films. The solution of the classical Heisenberg Hamiltonian for spinel ferrites done by some other researchers cannot be applied to explain Lithium ferrite. There are seven unknown parameters in the solution. They are $\frac{J}{\omega}$, $\frac{\sum_{m=1}^{N} \mathrm{Dm}(2)}{\omega}$, $\frac{H_{in}}{\omega}$, $\frac{H_{out}}{\omega}$, $\frac{K_s}{\omega}$, N and $\frac{\sum_{m=1}^{N} \mathrm{Dm}(4)}{\omega}$. The variation of total energy of Lithium ferrite thick films with angle and each unknown parameter was investigated separately. When the variation of total energy with angle and each parameter was studied, other six parameters were kept at some general constants. The variation of easy and hard axis with each parameter was also investigated. Although this simulation was performed only for $\frac{J}{\omega} = \frac{\sum_{m=1}^{N} \mathrm{Dm}(2)}{\omega} = \frac{H_{in}}{\omega} = \frac{H_{out}}{\omega} = \frac{K_s}{\omega} = 10$, $N = 1000$ and $\frac{\sum_{m=1}^{N} \mathrm{Dm}(4)}{\omega} = 5$ as an example, these equations can be applied for any value of $\frac{J}{\omega}$, $\frac{\sum_{m=1}^{N} \mathrm{Dm}(2)}{\omega}$, $\frac{H_{in}}{\omega}$, $\frac{H_{out}}{\omega}$, $\frac{K_s}{\omega}$, N and $\frac{\sum_{m=1}^{N} \mathrm{Dm}(4)}{\omega}$.