# MAGNETOSTATIC WAVES IN FERRITE MAGNONIC CYSTAL-DIELECTRIC-METAL STRUCTURE

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9.7 cm

Ferrite magnonic crystal (MC) represents ferrite film with surface 1D or 2D periodic structure. While propagating in MC magnetostatic waves (MSW) interaction of incident $q_{in}$ and reflected $q_{ref}$ waves results in formation of forbidden gaps in MSW spectra at wavenumbers $q_n$ satisfied Bragg condition $q = \pi n/d$, where $n$=1,2,..., $d$ is structure's period. Corresponding frequency bands of increased propagating losses were experimentally found at frequency regions $f_n$ linked with $q_n$ by corresponding dispersion characteristics $f = f(q)$ for surface (SMSW), backward volume (BWMSW) and forward volume (FMSW) MSW.

In ferrite-dielectric-metal (F-D-M) structure the slope of dispersion curve of MSW depends on thickness of dielectric $t$. Note that BWMSW and FMSW are reciprocal waves in contrast to SMSW. So in MC-dielectric-metal structure decreasing of $t$ for BWMSW and FMSW will change values of $f_n$ corresponding to $q_n$ satisfied Bragg condition.

In turn in case of SMSW $t = t^*$ for incident wave corresponds to $t = t^* + h$ ($h$ is film's thickness) for reflected wave as they propagate along different surfaces of ferrite film. So at small enough $t$ at the fixed frequency $q_{in}(t) \neq q_{ref}(t + h)$ that means that Bragg condition wouldn't be fulfilled and bands of increased propagating losses would disappear. This suggestion was experimentally justified for $t = 0$.

13.4 cm

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