While publishing the resuts of your simulations based on this code please reference C.S.Chang et al., *Appl. Phys. Lett.* **104**, 032408 (2014).

This worksheet calculates the field of dynamic magnetisation of the FVMSW driven by a microscopic coplanar antenna. The static magentic field is perpendicular to the plane of a continous ferromagnetic film.

SI units are used in this code!

Film thickness in meters:

$L := 110 \cdot 10^{-7} \cdot 10^{-2}$

Saturation magnetisation in A/m:

$M0 := 886 \cdot 4 \cdot \pi \cdot 80 = 8.907 \times 10^{5}$

in Gauss this is equivalent to:

$\frac{M0}{80} = 11133.80436$

Circular frequency in rad/sec:

$\omega := 2 \cdot \pi \cdot 10 \cdot 10^{9}$

In GHz this is equivalent to:

$\frac{\omega}{2 \cdot \pi \cdot 10^{9}} = 10$

Gilbert alpha:

$\alpha_G := 0.007$

The width of the signal and the ground lines of the coplanar line in meters

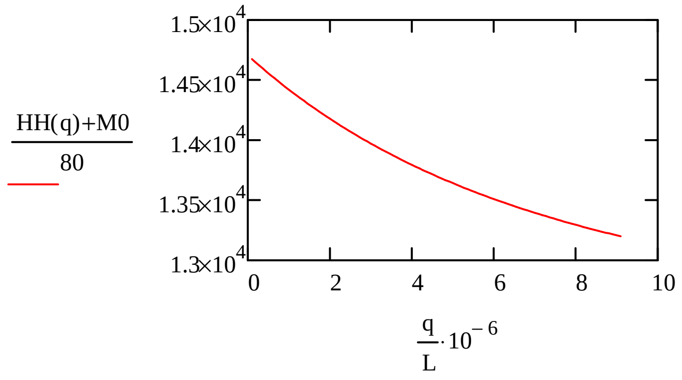
$w := 1.5 \cdot 10^{-4} \cdot 10^{-2} = 1.5 \times 10^{-6}$

The width of the gaps between the signal and the ground lines:

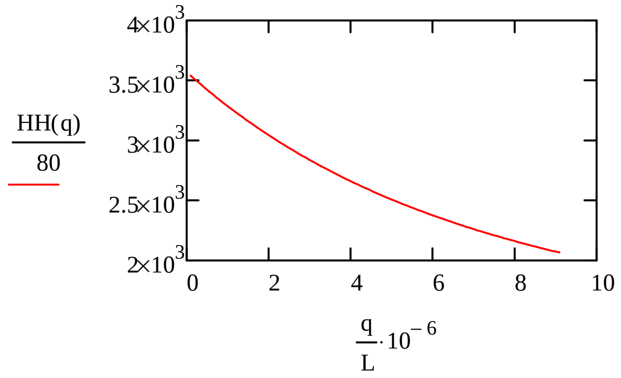
$\Delta := w \cdot 0.8$

$q := 0, 0.01 .. 1$

external (applied field) in Oe vs. wave number in μm1



internal field in Oe vs. wave number in μm1



Enter the coordinate range along the direction of wave propagation over which you wish to calculate spin wave amplitude. zs is the normalised co-ordinate, the respective absolute co-ordinate is zs*ws.

$zs := -20, -19.9 .. 20$

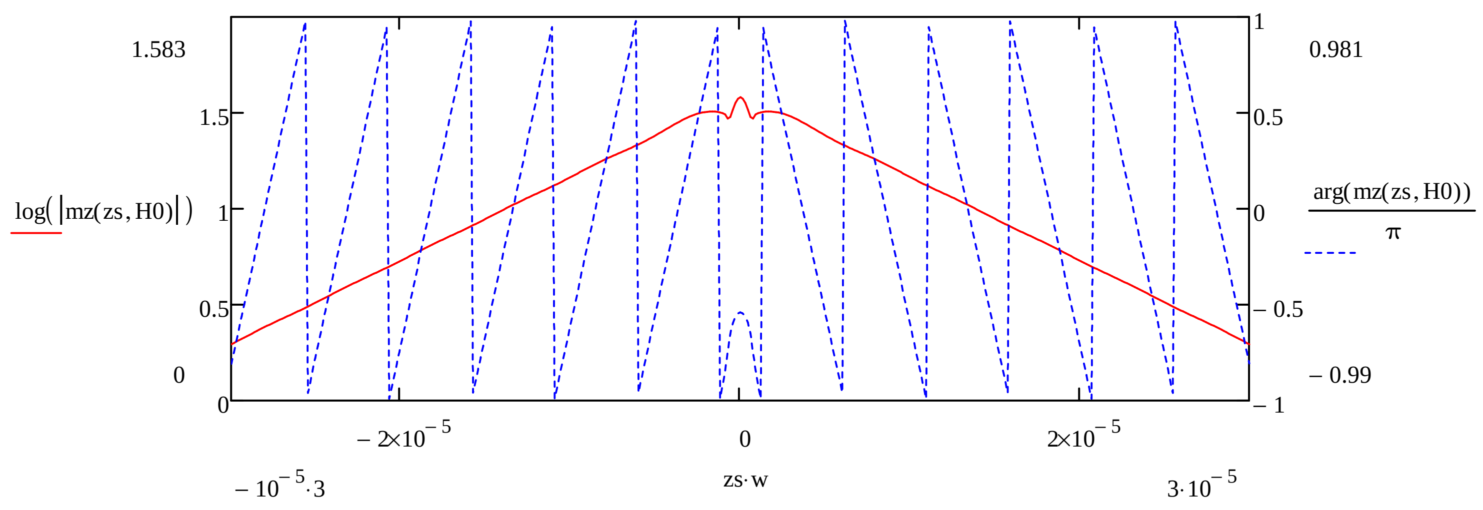
Calculated FMR *internal* field for the given frequency:

$Hr := \frac{\omega}{\gamma}$

$\frac{Hr}{80} = 3.571 \times 10^{3}$

Enter here some *internal* field value H0 for which you wish to calculate the dynamic magentisation profile for travelling DE waves. The excitation antenna axis is at zs=0. zs is the co-ordinate along the distace between the antennas.

$H0 := Hr \cdot 0.9$



1.583
1.5
1
0.5
0
0
log(|mz(zs, H0)|)
1
0.5
0
− 0.5
− 1
0.981
− 0.99
arg(mz(zs, H0)) / π
− 2×10^− 5
0
2×10^− 5
− 10^− 5·3
zs·w
3·10^− 5