Murata Software

Q: Can Femtet perform the analysis with mechanical damping taken into account?

A: The mechanical damping, 1/Qm, can be taken into account in the vibration analysis such as the harmonic and resonant analyses.

Please refer to the next slide.

Additional Information

The mechanical damping, 1/Qm, can be taken into account in the vibration analysis such as the harmonic and resonant analyses.

There are several parameters to specify for damping.

(1) Loss factor η (Loss tangent, tanδ): Enter the value of η or tanδ.

(2) Q factor: Enters the reciprocal of Qm (mechanical quality factor).

(3) Damping ratio ζ: Enter the value of ζ multiplied by 2.

(4) Rayleigh damping coefficients α and β: Enter the value of $\alpha/\omega i + \beta\omega i$ (ωi is a resonant frequency.)

If tanδ is entered, a real stiffness matrix, [C], and tanδ will give a complex stiffness matrix, [C]*, as follows:

$$[C]^* = [C](1 + j\tan\delta).$$

Please refer to the Femtet help menu below for the conversion of the parameters.

Home>Technical Notes>Stress Analysis>Analysis of Nonlinear Materials>Mechanical Damping