

Question 13

Q: What is the difference between harmonic analysis and resonant analysis?

A: Each analysis is performed as follows.

Harmonic analysis: The vibration driven by the vibration source with specified frequencies is solved.

Resonant analysis: The model's specific vibration characteristics, such as eigenfrequency or vibration mode, are solved.

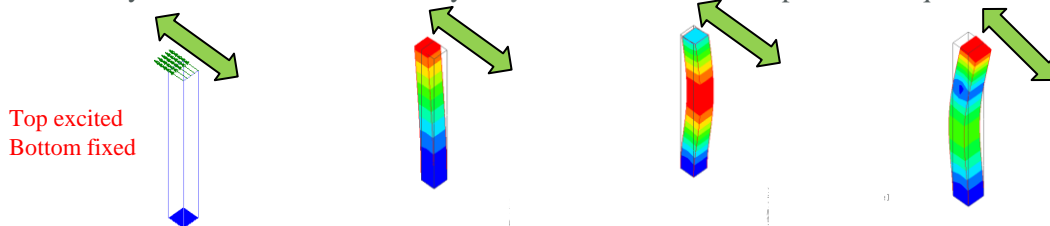
The impedance graphs with respect to the frequency are given in both the piezo-harmonic and piezo-resonant analyses, but the graphs are created through different procedures.

Please refer to the next slides.

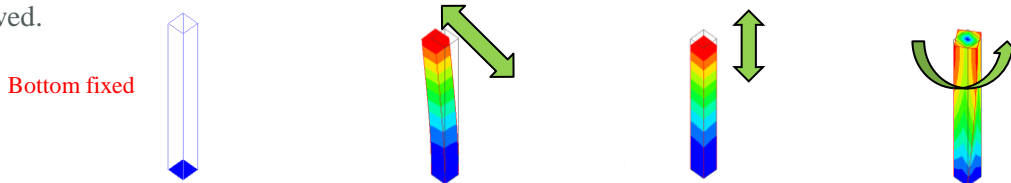
Difference between Harmonic Analysis and Resonant Analysis

Harmonic analysis: As the frequency increases, only the vibration mode that is specific to the vibration direction is excited.

Harmonic analysis: The vibration driven by the vibration source with specified frequencies is solved.



Resonant analysis: The model's specific vibration characteristics, such as eigenfrequency or vibration mode, are solved.



Resonant analysis: A variety of vibration modes can appear at higher frequencies.

Reference:

Home > Technical Notes > Piezoelectric Analysis > Matrix Equations for Piezoelectric Analysis

The impedance graphs with respect to the frequency are given in both the piezo-harmonic and piezo-resonant analyses, but the graphs are created through different procedures.

Harmonic Analysis

Calculate at multiple frequencies and graph the resulting impedance.

Resonant Analysis

Calculate circuit constants and make an impedance graph using those constants.

Reference

The model of Example 2: Harmonic Analysis of Piezoelectric Analysis [Rayleigh] on the Femtet help menu is analyzed in the harmonic and resonant analyses for comparison.

