

DOS 2021 : Finite Elements

Number of participants: 15

1

A finite element model with N degrees of freedom has

✓ N

eigenfrequencies and mode shapes

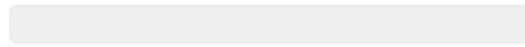


100%

15 votes

2N

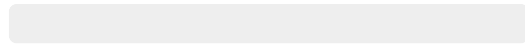
eigenfrequencies and mode shapes



0%

0 votes

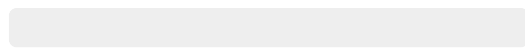
an infinity number of eigenfrequencies and mode shapes



0%

0 votes

It depends on the frequency band and location of the excitation



0%

0 votes

2

The damping matrix for Rayleigh damping is given by

C = constant



0%

0
votes

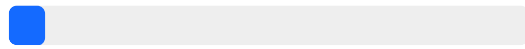
✓ C = alpha K +
beta M



93%

13
votes

C = alpha
omega K

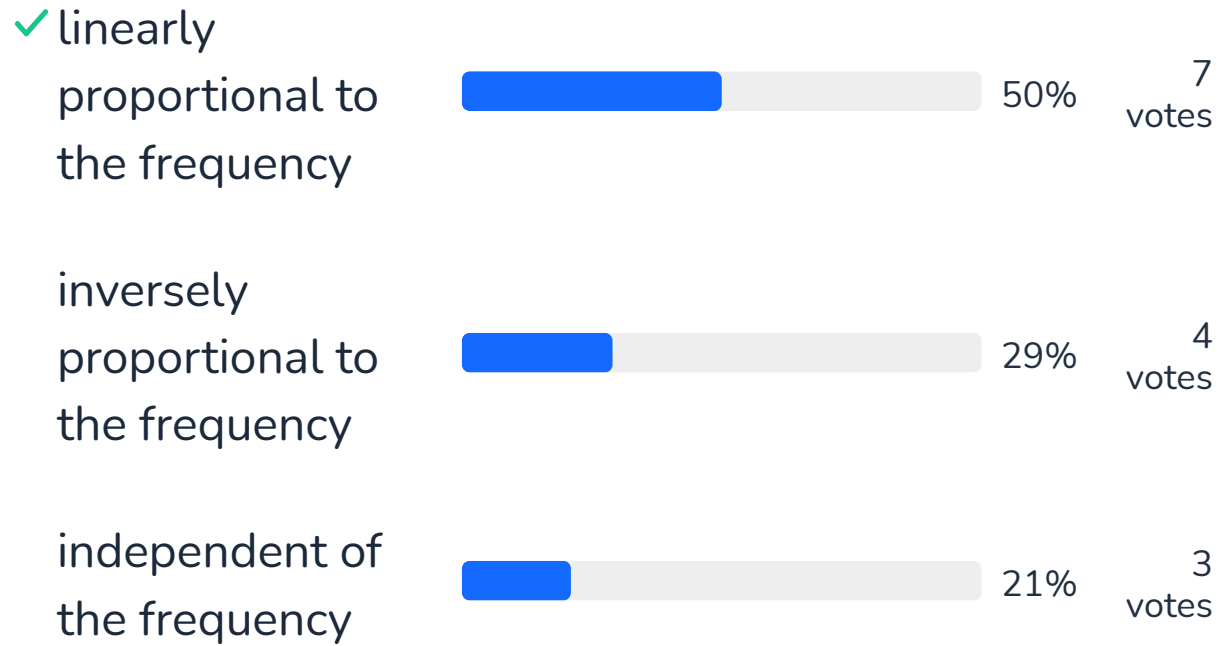


7%

1 vote

3

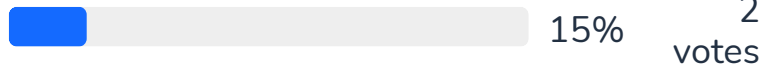
For a global viscous damping model, the modal damping coefficient is



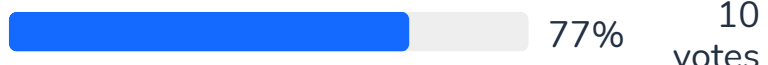
4

The use of a constant material loss factor for damping leads to modal damping coefficients

which depend linearly on the frequency and the loss factor



✓ which are constant with the frequency equal to the loss factor divided by 2

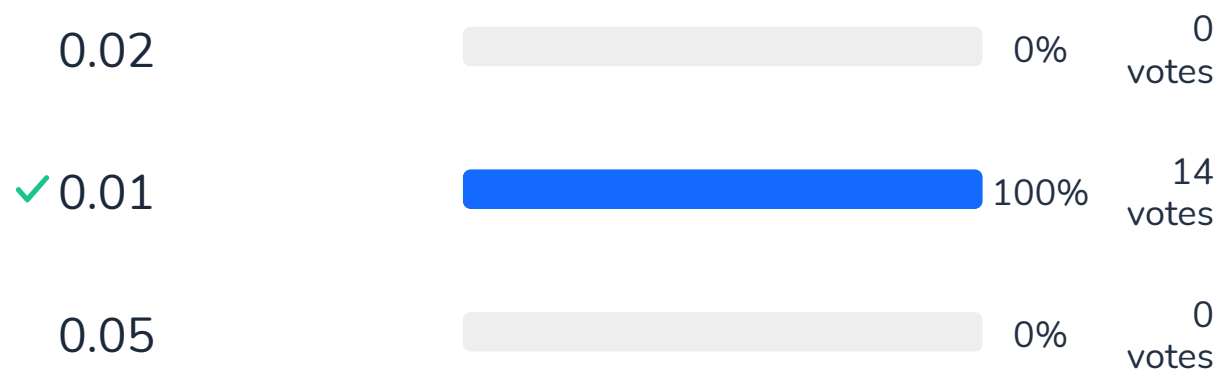


which evolve with the square of the frequency and proportionally to the loss factor



5

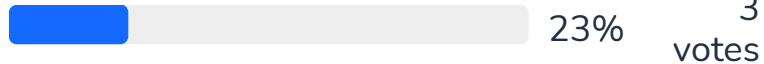
If a structure is made of a single material with a loss factor $\eta=0.02$, the modal damping coefficient for all modes is equal to



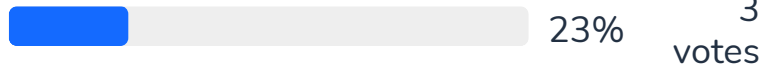
6

When using local damping models

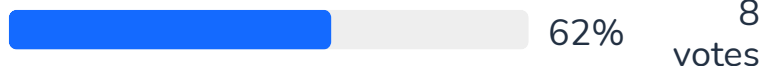
the damping matrix in the modal domain remains diagonal



✓ the damping matrix in the modal domain is not diagonal



✓ the damping matrix can be made diagonal if the damping is small



damping can be neglected when solving the equations of motion



7

For structures which undergo base excitation, the mode shapes are computed

✓ With the DOFS fixed where the acceleration is imposed



In free-free boundary conditions

