

Bending vibration systems which are complementary with respect to eigenvalues

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Abstract: In developing prototypes, one fundamental activity is to model appropriate systems which mimic fundamental features of (biological) paradigms. In this way, we set up different models for the investigation of natural frequencies. The aim is to detect object contacts of technical sensors in observing their vibration behavior. For this, we compare the range and the shift of natural frequencies determined from the analysis of the arising two-point boundary-value problems. In particular, we found two systems with complementary spectra of eigenvalues. Because of boundary damping we analyzed these eigenvalues in the first octant of the complex plane. The fundamental result is that these two systems offer no common eigenvalue, they are alternative. This is an interesting and unique observation.

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