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附加约束阻尼层后梁的振动分析

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VIBRATION ANALYSIS OF THE BEAM WITH AN ATTACHED CONSTRAINED DAMPING LAYER

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摘要

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摘要 研究附加约束阻尼层后梁的振动分析。在引入的位移模式中考虑了附加部分对原结构运动的相对性和阻尼层的横向剪切效应, 据此推导了附加阻尼层后梁的运动方程和边界条件。通过对简支状态时梁的固有振动分析, 讨论了其振动特点。同时给出了等效复刚度公式, 它比原有的公式具有更高的计算精度

关键词: 约束阻尼层 梁的振动 粘弹性

Abstract: This paper deals with the vibration of the beam with an attached constrained damping layer. Firstly, in the displacement modeling, the transverse shear effect of the attachment on the beam structure is considered, and its displacement is treated as the composition of the base movement and its relative motion to the base. Then, the vibration equation and the boundary conditions are given. Through the natural vibration analysis of a simply supported beam with the attached constrained viscoelastic damping layer, the interaction between the axial vibration, the transverse shear vibration and the bending vibration is discussed. Finally, an effective formula of complex bending rigidity is derived according to the solution in the simply supported state. It is proved by the numerical examples that this formula possesses higher computational precision than the others.

Keywords: constrained damping layer vibration of beam viscoelasticity

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