

# R-函数理论及准Green函数方法在正交各向异性板振动问题中的应用

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Title: R-function theory and Quasi-Green function method for free vibration of clamped orthotropic thin plates

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摘要: 首次将R-函数理论及准Green函数方法应用于求解固支正交各向异性薄板的自由振动问题。首先引入参数变换,将正交各向异性薄板的自由振动微分方程转化为双调和算子的边值问题,并应用R-函数理论,以解析函数形式描述复杂边界形状;利用问题的基本解和边界方程构造了一个准Green函数,该函数满足了问题的齐次边界条件;通过R-函数理论构造适当的边界方程,消除了积分方程核的奇异性;再采用Green公式将其化为第二类Fredholm积分方程。数值算例表明:该方法减少了理论计算量,精度较高。本文还证明了其优越性和正确性,是一种新型的数学方法。

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