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## 整体叶盘结构失谐振动的国内外研究状况

### Research on vibration problem of integral mistuned bladed disk assemblies at home and abroad

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中文关键词: [整体叶盘结构](#) [失谐振动](#) [局部化](#) [可靠性](#) [稳健性](#)英文关键词: [integral bladed disk assemblies](#) [mistuned vibration](#) [localization](#) [reliability](#) [robustness](#)

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中文摘要:

阐述了整体叶盘结构失谐问题, 包括模态、响应局部化, 局部化因子, 失谐叶盘结构分析模型和求解方法, 重点对近10年研究的热点问题, 如非线性、颤振、灵敏度、气动与结构耦合、失谐识别与预测、失谐优化、“错频”失谐、多级多部件叶盘结构耦合、科氏力、可靠性、稳健性等最新的研究成果做了详细的评述。最后提出了需进一步深入研究的问题, 如建立更高效、更高精度、更具适用性的模型, 真正采用试验方法对理论仿真模拟进一步地验证, 气动与结构耦合以及叶冠间隙和摩擦耦合等因素对多级叶盘共同作用, 科氏力产生机理, 叶盘对失谐的不敏感度及稳健性等。

英文摘要:

Mistuned integral bladed disk assemblies, including the mode, the vibration transmission localization and the localization factors, were elaborated. Besides, the modeling and solving methods of mistuned bladed disk assemblies were discussed. The mainly related hot topics, the latest research methods and their achievements in recent 10 years, were reviewed and investigated in detail, including: nonlinearity, flutter, sensitivity, pneumatic and structure coupling, mistuning identification and prediction, mistuning optimization, intentionally mistuning, multi-stage and multi-component disks coupling, Coriolis forces, reliability and robustness etc. Finally, potential topics for future research work were proposed, for instance, building a more effective and applicative model with higher precision, verifying theoretical simulation with the test method, impact on multi-stage and multi-component integral bladed disk assemblies of pneumatic and structure coupling as well as the shroud tip and friction coupling, the principle of Coriolis forces, insensitivity and robustness to the mistuning of bladed disk assemblies and so on.