多频率约束下振动筛动态拓扑优化设计

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摘要

应用多频率约束下板结构加筋动态拓扑优化方法，
提高了振动筛筛体的刚度。为了避免映射求解的麻烦和载荷病态，提出了单元（或单元组）特征值灵敏度，
并给出了识别被删除单元（或单元组）的多模态无量纲混合测度。描述了优化过程，
在板结构中增加可能的加强筋形成基础结构，
并将单元按加强筋为单位分组。该方法应用在振动筛筛壁的加筋布局优化中，得到了理想的优化结构。

关键词　固体力学　多频率约束　拓扑优化　单元特征值灵敏度

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Dynamic topological optimization of griddle under multiple frequencies constraints

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Abstract The stiffness of a griddle body was enhanced using dynamic topological optimization under multiple frequencies constraints. In order to avoid the tedium solution of mapping and ill loading cases, the element (or element group) sensitivity of eigenvalue was presented. The non dimensional measure used for identification of the element (or element group) under multiple frequencies constraints to be changed is given. The optimal procedure is described. In the optimal process, available stiffeners were added to the structure as to form the base structure, and the added elements are divided into groups base on the stiffeners. The present procedure was implemented for the griddle body, and effective results were obtained.

Key words solid　state mechanics　multiple frequencies constraints　topological optimization　element sensitivity of eigenvalue

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