

## 基于多场耦合的电子装备机箱结构优化设计

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## The Optimization Design of Electronic Equipments' Case Based on Multi-field-coupled Model

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摘要

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**摘要** 电子装备机箱结构设计受到结构强度、通风散热和电磁屏蔽三方面的约束。实际工作中的电子装备受到结构位移场、温度场和电磁场的共同作用，它们都是机箱结构参数的函数。由于机箱的电磁场、温度场和结构位移场之间存在一定耦合关系，该文建立了电子装备的多场耦合模型，并在此基础上提出多场耦合的优化模型，可用于实际机箱结构的优化设计。最后，将其应用于某电子设备机箱实物的结构优化设计，取得了满意的结果。

**关键词：** 电磁屏蔽 电子装备 多场耦合 优化设计

**Abstract:** Design of Electronic cabinet is constrained by structure intensity, ventilation and Shielding Effectiveness (SE). Practically, there are three fields affecting electronic equipment, electromagnetic, temperature, and elastic deformation fields which are functions of enclosure structure parameters. Because of the relationship between three fields, in this paper, a multi-field-coupled model called STEM is established. Furthermore, an optimization model based on STEM is proposed in this manuscript. Structure optimization is also proposed on a practical enclosure with satisfying result.

**Keywords:** Electromagnetic shielding Electronic equipment Multi-field-coupled Optimal design

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