

技术及应用

EAST托卡马克绝缘子低温力学性能理论及实验分析

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摘要 复合材料绝缘子是EAST托卡马克磁体系统的关键部件, 担负着整个磁体系统低温冷却回路与高压部件的对地绝缘作用。运行中, 绝缘子在低温下要承受较高的内压及电压, 保持绝缘子在低温状态下的机械整体性是运行安全的必要保证。从整个装置的使用安全考虑, 有必要对绝缘子低温力学性能作全面分析。本工作首先对绝缘子的机械低温力学性能进行理论分析, 然后通过设计的低温力学实验验证理论分析结果。以此为基础, 对装置中的损坏绝缘子进行分析, 确定损坏原因。

关键词 [复合材料绝缘子](#); [低温力学性能](#); [EAST托卡马克](#)

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Theoretical and Experimental Analysis of Cryogenic Mechanics Property

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Abstract Composite insulators are important component for EAST Tokamak magnet system, and the insulators are needed to insulate all cryogenic supply lines which are on ground potential from the high voltage potential of winding. The insulators have to withstand the hydraulic pressure and high voltage during all operation modes. Keeping mechanical integrity of the component under operation conditions is the most important. For safe reason, an overall check and analysis of cryogenic mechanics property for EAST Tokamak composite insulators is needed. The theoretical analysis of cryogenic mechanics property for EAST Tokamak composite insulators was carried out, and the result by the way of experiment was validated. Based on this, the damage causes of the insulators were also analyzed.

Key words [composite insulators](#) [cryogenic mechanics property](#) [EAST Tokamak](#)

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