

## 高电压技术

### 复杂地形情况下高压交流输电线路电磁环境特性分析

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#### 摘要:

为研究复杂地形高压交流输电线路电磁环境, 基于镜像法的思想, 提出改进格林函数的模拟电荷法。给出该方法的理论框架和实施步骤, 并进行验证; 分析不同角度斜坡, 不同高度特高压交流输电线路的电磁环境特性。分析结果表明: 斜坡对输电线路的工频电场影响较明显, 其影响是先减小后增加; 斜坡对输电线路的可听噪声和无线电干扰的影响不明显。由该方法建模所得结果, 可为高压交流输电线路在复杂地形架设时, 线路设计和电磁环境分析提供参考。

**关键词:** 特高压输电线路 复杂地形 模拟电荷法 电磁环境

### Analysis on Electromagnetic Environment Characteristics of High-Voltage AC Transmission Lines Passing through Complex Terrains

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#### Abstract:

To study the electromagnetic environment of high-voltage AC transmission lines passing through complex terrains, according to the method of images an improved Green function method is proposed to simulate the charge distribution. The theoretical framework and implementation steps of the proposed method are given and verified. The electromagnetic environment characteristics of ultra high voltage (UHV) AC transmission lines with different heights above the ramp with different slope angles are analyzed. Analysis results show that the influence of slope ramp on power frequency electric field of UHVAC transmission line is evident, the effect is that before transmission line arrives at the slope ramp, the power frequency electric field of UHVAC transmission line is weakened and the field is strengthened while it comes to the slope ramp. The influences of slope ramp on audible noise and radio interference are not evident. The results from the proposed modeling method are available for reference to the design and construction of UHVAC transmission line when it passes through complex terrains.

**Keywords:** ultra high voltage (UHV) transmission lines complex terrains charge simulation method (CSM) electromagnetic environment

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