

## 特高杆塔的多波阻抗模型设计及雷击暂态特性分析

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### 摘要

在特高杆塔遭受雷击的暂态过程中波过程占主导地位, 因此特高杆塔的防雷设计与普通杆塔有本质区别, 传统杆塔模型也不能套用在特高杆塔雷击暂态特性计算中。文章对国内外已有波阻抗杆塔模型做简要介绍, 并在此基础上提出一种新的改进特高杆塔波阻抗模型, 该模型考虑到塔身不同处波阻抗不同, 将塔身分为多段分别计算波阻抗值。对雷击时暂态过程的分析说明新波阻抗模型更符合雷击时的实际情况, 并应用该模型仿真分析了波阻抗、接地电阻及避雷线对特高杆塔雷击暂态特性的影响, 为特高杆塔防雷设计提供了参考依据。

关键词 [高电压技术](#); [防雷设计](#); [特高杆塔](#); [波阻抗模型](#)

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## Design of Multi-Surge Impedance Model for Ultra-High Transmission Tower and Analysis on Its Transient Characteristic Caused by Lightning Stroke

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### Abstract

Surge response plays a leading role in the transient process caused by lightning stroke to the top of ultra-high transmission tower, so the design of lightning protection for ultra-high transmission tower differs from those for common transmission towers essentially, thus the traditional tower models cannot continue to use in transient characteristic calculation of ultra-high transmission tower as well. In this paper the existing surge impedance models for transmission towers home and abroad are introduced in brief, on this basis the authors propose a new improved surge impedance model for ultra-high transmission tower. Considering the fact that the surge impedances corresponding to different positions of the tower body are not same, the tower body is divided into multi pieces and the surge impedance of each piece is calculated respectively. The result of analysis on transient process of ultra-high transmission tower during lightning stroke shows that the new improved surge impedance model can tally with actual condition better while lightning stroke occurs. By use of the proposed multi-surge impedance model the influences of surge impedance, grounding resistance and overhead grounding wire on lightning stroke caused transient characteristic of ultra-high transmission tower are simulated, and simulation results are available for reference to the design of ultra-high transmission tower.

Key words [high voltage engineering](#); [lightning protection design](#); [ultra-high transmission tower](#); [surge impedance model](#)

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