

SCALE MODELS AND THEIR APPLICATION TO THE STUDY OF LIGHTNING TRANSIENTS IN POWER SYSTEMS

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The scale model technique is a very powerful and versatile tool for the analysis of the interaction of lightning with electric power lines and well complements other methods such as rocket-triggered lightning and experiments with full-scale systems. It enables the simulation of a wide variety of situations, and, moreover, tests *756 Lightning electromagnetics* can be carried out under controlled conditions. After the system implementation, a substantial amount of data can be obtained in a relatively short time.

An important application of scale models concerns the validation of theoretical models of complex phenomena and their relevant codes. They can also be very useful in the evaluation of the influence of the line configuration and of various lightning parameters on the magnitudes and waveforms of overvoltages, which can be assessed with satisfactory accuracy. In this chapter, the usefulness of the method was illustrated by its application for the validation of the ERM and LIOV-EMTP predictions, as well as for the investigation of the behaviour of lightning transients on overhead power transmission and distribution lines subjected to direct and indirect strokes. The technique is particularly suitable for the analysis of situations that are either too complex or not worthwhile to be treated theoretically, as e.g. the case of lightning-induced voltages on urban power distribution networks surrounded by nearby buildings.

In: Cooray, Vernon (Ed.) *Lightning electromagnetics*, IET, 2012. cap. 19.

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