Induced voltages on distribution lines due to lightning discharges on nearby metallic structures

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Abstract

This paper presents a numerical method for the calculation of voltages induced on overhead lines due to lightning discharges striking a metallic structure in its vicinity. The calculation is done from the determination of the electric and magnetic potentials associated with the charges in the return stroke channel and with the currents that propagate in the channel and in the structure. It is shown that in this situation the induced voltages may differ significantly from those originated by lightning discharges direct to the ground. Comparisons between measured and calculated voltage waveforms confirm the validity of the procedure