

Study of the Lightning Discharge Induced Electromagnetic Coupling to Buried Cable

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In order to determine the effects of the lightning-induced currents inside a buried cable, a simulation campaign of the Telegraphist equations has been accomplished. However, before running the calculations, special attention was paid to the components of the Telegraphist equations, in particular to the ground impedance and ground admittance. These two elements are based on complex equations. In this work approximation formulae have been evaluated in order to find a non oscillatory, simpler formulation.

In a second phase, the lightning induced currents and voltages of the buried cable have been simulated using the FDTD method of first order in Fortran. This method requires to determine the current and the voltage at the first step in space and time domain. Particular care had to be taken to assign correct equations of the terminations current and voltage.

Finally, the simulations were compared to the measurements of the shield cable current, accomplish at Camp Blanding in 2002.