MESTRINER, Danielli; BRIGNONE, Massimo; PROCOPIO, Renato; NICORA, Martino; FIORI, Elisabetta; PIANTINI, Alexandre; RACHIDI, Farhad. An Efficient Methodology for the Evaluation of the Lightning Performance of Overhead Lines**.** ***IEEE Transactions on Electromagnetic Compatibility***, v.63, n. 4, p. 1137-1145, Aug. 2021.
doi: 10.1109/TEMC.2021.3054427.

ABSTRACT

This article proposes a method for the derivation of a formula that links the maximum lightning-induced-overvoltage occurring on an overhead distribution line with the variables that characterize the lightning return stroke, such as the peak current, front duration, and stroke location. The coefficients of such formulas are obtained thanks to a limited number of lightning field-to-line coupling simulations, thus guaranteeing a significant computational time saving with respect to already existing methods. The method is presented first with a preliminary analysis to get some insight into the functional relationship between each of such variables and the overvoltage. Then, the method is presented and validated against numerical calculations performed with a dedicated code, both in terms of punctual evaluations and overvoltage distribution.