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Induced Current Distribution in 3D Soil Model as Lightning Impulse Discharge Strike Earth Surface (Conference Paper)

Fajingbesi, F.E.[a], Shahida Midi, N.[a], Elsheikh, E.M.A.[b], Hajar Yusoff, S.[a], Khan, S.[a], Azman, A.W.[a]

[a]International Islamic University, Electrical and Computer Engineering, Gombak, Malaysia
[b]University Kuala Lumpur, Electrical Engineering Section Kampus Cawangan, Gombak, Malaysia

Abstract

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Discharge current distribution generated as a lightning strike traverse from the atmosphere into a soil surface and below with varying conductivity were investigated using a laboratory-size electrode configuration system consisting of a point discharge electrode and nine under-soil grounding electrodes. Discharge emission and the electric potential of the soil were with significant change upon slight variation in soil conductivity across the surface and along with an increase in depth. Non-linear degradation phenomena in the soil conductivity also occur after a subsequent discharge of lightning strike indicating a breakdown of soil properties. The results of a numerical model in COMSOL Multiphysics AC/DC module further shed a graphical illustration of the current pathway validating the experimental data. © 2019 IEEE.

SciVal Topic Prominence

Topic: Grounding Electrodes | Lightning | Impulse Generators

Prominence percentile: 90.085

Author keywords

Discharge Current | Ionization parameters | Lightning Discharge | Soil Conductivity

Indexed keywords

Engineering controlled terms: 3D modeling | Electric current distribution measurement | Electric grounding | Electric potential | Grounding electrodes | Lightning

Engineering uncontrolled terms: Comsol multiphysics | Current distribution | Discharge currents | Electrode configurations | Graphical illustrations | Lightning impulse | Lightning strikes | Soil conductivity

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