2017 International Symposium on Lightning Protection (XIV SIPDA 2017)

Natal, Brazil 2-6 October 2017



IEEE Catalog Number: CFP1711W-POD ISBN: 978-1-5090-6054-2

Copyright \odot 2017 by the Institute of Electrical and Electronics Engineers, Inc. All Rights Reserved

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

*** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.

 IEEE Catalog Number:
 CFP1711W-POD

 ISBN (Print-On-Demand):
 978-1-5090-6054-2

 ISBN (Online):
 978-1-5090-6053-5

Additional Copies of This Publication Are Available From:

Curran Associates, Inc 57 Morehouse Lane Red Hook, NY 12571 USA Phone: (845) 758-0400 Fax: (845) 758-2633

E-mail: curran@proceedings.com Web: www.proceedings.com



The Peak Value of Lightning-Induced Voltages in Overhead Lines for High Resistivity Soils	1
Effect of Line Voltage on Lightning Attachment to 220-kV and 500-kV Lines	7
Currents on Electric Installations Inside of Buildings in Case of Lightning Equipotential Bonding at the Roof	14
Classification of CIDs observed in Florida using the Lightning Detection and Waveform Storage System (LDWSS)	20
Using circuit elements to represent the distributed parameters of a grounding systems under lightning strokes	28
Evaluation of EUCLID IC/CG Classification Performance Based on Ground-Truth Data	35
Mathematical Modeling for Analysis and Design of LPS: Angle Method	42
Test of Statistical Procedures for Determining the Impulse Withstand Voltage of a Three-Phase Compact Line Structure Considering Bare Cables	49
Methodology to select Lightning Protection Measures based on Brazilian Standards and Technology	55
Connection between the Middle Tropospheric Cyclonic Vortexes, Mesoscale Convective Complexes and Thunderstorms	61
Analysis of the thunderstorm forecasting methods in the province of Luanda, Angola	69
Project of LPS for Rocket Launcher of the Barreira do Inferno Launch Center – CLBI	74
A Comparison of Different Wideband Models for a Single-Phase Distribution Transformer	78
Automatic detection of fault patterns in lightning arresters	84
Surge Arresters Modeling for Electromagnetic Transient Analysis in Power Systems	92
A Meteorological Variables Study and its Correlation with Thunderstorm Activity over Medellin City (Colombia)	97
Effectiveness of low-impedance down-conductors	0 :3

An Open Framework for Lightning Performance of Overhead Transmission Lines	110
Analysis of Shielding Failure in Transmission Lines Considering Complex Terrain	116
Adjustment of current waveform parameters for first lightning strokes: Representation by Heidler functions	121
Calculation of the External Parameters of Overhead Insulated Cables Considering Proximity Effects	127
Grounding Resistance Measurements Using Very Short Current and Potential Leads	132
Analysis of Cloud-to-Ground Lightning Density in Brazil	138
AeroRayos first tool for risk assessment by Electric Activity at airports in Argentina	141
Electric charge flow in linear circuits	145
Influence of Cable Insulating Material on the Impulse Withstand Voltage of a Single-Phase Compact Distribution Line Structure	152
Lightning Protection for Power Cables Connected to Aviation Lights on an Airport Runway	157
Determination of the probability function of lightning peak currents on flat ground	162
Investigation of Lightning Parameters occurring on Offshore Wind Farms	169
Performance of Surge Arrestors Under Single and Multiple Lightning Impulses	176
Simultaneous Records of Current and 380-km Distant Electric Field of a Bipolar Lightning Flash	183
New Circuit for the Measurement of Lightning Generated Electric Fields	188
A contribution to the study of ground grids impulse impedance, based on field measurements	195
Experimental Verifications of Direct Lightning Protection in Flammable Liquid Storage Tanks: Cases of Carbon-Steel and Aluminum Geodesic Domes	202
Transient Measurements in the Austrian High Voltage Transmission System	208
Estimation of Ionospheric Reflection Heights Using CG and IC Lightning Electric Field Waveforms	212
Lightning Location Systems Detection Efficiency: An approach using the Transmission Line (TL) Engineering Model	218

The Horse, the Cowboy and the Lightning Modeling: a Case Study on a Farm in the State of Minas Gerais, Brazil	226
Experimental Assessment of Induced Voltage in a Scaled Building Directly Hit by Lightning	234
Development of mathematical model of processes in multi-chamber arrester for identification of criteria of arc extinction	240
Assessment of Lightning Overvoltages on Lines with Different Voltages Sharing the Same Structures	244
Construction of a computational platform for lps dimensioning according to ABNT NBR 5419:2015	250
Development of FDTD-based Computational Tool for Lightning Performance Evaluations of Electrical Systems	256
An Improved Methodology for Evaluation of Lightning Effects on Distribution Networks	261
Analysis of Grounding Problems using IEFGM Meshless Method with Current Injection	268
Lightning strikes on Power Transmission Lines and Lightning Detection in Colombia	273
Artificial Intelligence-based Lightning Protection of Smart Grid Distribution System	279
Overvoltage Analysis of Transmission Towers Considering the Influence of Tower-Footing Impedance	287
Fatal livestock lightning accident in Colombia	295
Electronic Circuit for accurate Measuring of Lightning Continuous Currents sensed by Rogowski Coil	299
Upward flashes triggering mechanisms	304
Technical Economic Analysis of Design Methods of Subtransmission Line Grounding Systems	308
Substation Lightning Invaded Over-voltage Monitoring System Based on Arrester Valve Divider	315
Preliminary comparison of direct electric current measurements in lightning rods and peak current estimates from lightning location systems	319
Area-of-interest probability maps for forensic investigation using LLS data	324

Electronic Peak Lightning Current Detector	329
Estimating Detection Efficiency in the Absence of Satellites: ENTLN detection efficiency in 2015 and 2016	333
Variation of Lightning Peak Current Parameter as a Function of Cloud-to-Ground Lightning Flash Density in Colombia	336
Analysis of grounding systems and lightning overvoltages in a 69 kV line in Maceió, Brazil	341
Impact of Multiple Earthing Connections of the LPS on the Lightning Efficiency of Substation Grounding Grids	347
The Effect of Frequency Dependence of Soil Electrical Parameters on the Lightning Performance of Typical Wind-Turbine Grounding Systems	353
Severe thunderstorms in the Colombia and Venezuela high lightning active areas	359
Lightning Performance of Transmission Lines Partially Protected by Surge Arresters Considering Typical Brazilian Conditions	365
A System for Experimental Studies of Lightning Currents and Overvoltages	370
Close and Distant Electric Fields due to Lightning Attaching to the Gaisberg Tower	376
Attractive zone of lightning rods evaluated with a leader progression model in a common building in Brazil	380
Can Grounding Affect Lightning?	389
The return stroke current attenuation function: available models and identification methods from field measurements	402
Lightning Performance of Equipment for Power Distribution Lines	413