High Voltage Laboratory
School of Electrical & Computer Engineering
Faculty of Engineering
Aristotle University of Thessaloniki

H.F.R.I.
Hellenic Foundation for Research & Innovation

SPOTS

Surge Protection of Overhead Transmission System

Presentation of Research Results

Wednesday, 26th of June 2024

The research project is supported by the Hellenic Foundation for Research and Innovation (H.F.R.I.) under the “2nd Call for H.F.R.I. Research Projects to support Post-Doctoral Researchers”

(H.F.R.I. Project Number: 367, A.U.TH RC Project Number: 98156)

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Foreword

The High Voltage Laboratory (HVL) of the Aristotle University of Thessaloniki (AUTh) is proud to invite you to attend the hybrid event organized for presenting and disseminating the research results of the SPOTS project. This event will provide the opportunity for fruitful discussions on the lightning performance and protection of overhead transmission lines, aspiring to become a basis for further research work in the field.

The hybrid event will take place on Wednesday, the 26th of June 2024, 16:30 (Eastern European Summer Time, UTC+03:00) at the conference room located at the ground floor of Building D, Faculty of Engineering, Aristotle University of Thessaloniki, Thessaloniki, Greece. Live streaming will be provided through Zoom.

Prof. P.N. Mikropoulos
Director of the HVL, AUTh

Dr. Z.G. Datsios
Principal Investigator of SPOTS

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zoom

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Surge Protection of Overhead Transmission System – SPOTS

Lightning is one of the main causes of power system disturbances and faults, resulting in power quality issues, failures and outages. Thus, lightning has a serious adverse economic and social impact. The consequences of lightning are more relevant today due to the restructuring of the power system with the introduction of vulnerable dispersed renewable energy sources and smart grids. Regarding overhead transmission lines, more than 50% of outages are caused by lightning strikes. Lightning-related power supply interruptions, even of short duration, have a huge economic impact. Hence, the evaluation of the lightning performance of overhead lines is of crucial importance for their design and reliable operation. However, several simplifying assumptions are typically adopted when estimating the lightning flashover rate of the lines.

SPOTS aims to contribute to the more accurate estimation of the lightning flashover rate and to the lightning protection of overhead lines through lightning attachment and transient simulations. A new fractal-based model has been developed to consider the stochastic nature of lightning discharge propagation and attachment. Lightning transients have been studied through ATP-EMTP software, performing extended parametric analyses. A generalized methodology for the accurate estimation of the lightning performance of overhead lines has been developed. Results have been verified against field data and observations. The above enable quantifying the effects of several parameters on the lightning performance of typical overhead lines, for developing lightning protection guidelines as well as guidelines for the selection and application of transmission line surge arresters.

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SPOTS Research Team

Principal Investigator
Dr. Zacharias G. Datsios
Research Associate, HVL, AUTh

Member
Dr. Alexios I. Ioannidis
Research Associate, HVL, AUTh

Member
Diamantis G. Patsalis
PhD Candidate, HVL, AUTh

SPOTS Advisory Board

Professor
Pantelis N. Mikropoulos
Director, HVL, AUTh

Associate Professor
Thomas E. Tsovilis
HVL, AUTh

Associate Professor
Theofilos A. Papadopoulos
Democritus University of Thrace

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16:30-16:35	P.N. Mikropoulos Professor, Director of HVL, AUTh	Opening address
16:35-16:45	Z.G. Datsios PI of SPOTS	Presentation of the SPOTS project
Part A – Research Results of SPOTS		
16:45-17:10	A.I. Ioannidis SPOTS Research Team	Fractal-based lightning attachment model and simulation results
17:10-17:35	D.G. Patsalis SPOTS Research Team	Results of lightning overvoltage simulations
17:35-18:00	Z.G. Datsios PI of SPOTS	Lightning performance estimation methodology and lightning protection of overhead lines
18:00-18:10	Break	
Part B – Research Activity of Advisory Board Members		
18:10-18:35	P.N. Mikropoulos Professor, Director of HVL, AUTh	Corona effects on overhead lines
18:35-19:00	T.E. Tsovilis Associate Professor, HVL, AUTh	Surge protection
19:00-19:25	T.A. Papadopoulos Associate Professor, Democritus University of Thrace, Greece	The LineCableLab Toolbox
19:25-19:45	Discussion	

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