



# Program Overview

Sessions:	Time (SAST)	Sun 2 Oct		Mon 3 Oct		Tue 4 Oct		Wed 5 Oct		Thu 6 Oct		Fri 7 Oct	
		Room 1	Room 2	Room 1	Room 2	Room 1	Room 2	Room 1	Room 2	Room 1	Room 2	Room 1	Room 2
Morning 1	08:00			Opening Ceremony		LEMP - Applications	Protection of Renewable Energy Systems 1	Invited Talk		Flash, Strokes and GSPs	Protection of Infrastructure 2	Safety - Statistics and Awareness	Protection of Railway Systems
Coffee break Morning	09:45												
Morning 2	10:15			Lightning Physics and Discharge	Protection and Performance of Transmission and Distribution Lines 1	Testing - Laboratory Experiments 1	Protection of Renewable Energy Systems 2	Lightning Occurrence Characteristics 1	Protection and Performance of Transmission and Distribution Lines 2	Lightning and the Environment	Protection and Performance of Transmission and Distribution Lines 3	Safety - Case Studies	Testing - Human Safety
Lunch	12:00											Closing Ceremony	
Afternoon 1	13:00			Lightning Discharge and Attachment	Earthing for Transmission Lines	Testing - Laboratory Experiments 2	Down Conductors and Earthing	Lightning Occurrence Characteristics 2	Modelling of Soil Resistivity	Tour			
Coffee break Afternoon	14:45	Cigré Working Group Meetings				Poster Session							
Afternoon 2	15:15			LEMP - Return Stroke Modelling	Power System Protection and Analysis							Nowcasting and AI	Testing - Standards
	17:00	Registration											
Evening	18:00	Rhino Cocktail				Lion Dinner				Elephant Banquet			



### Monday 3 October 2022 - Morning Sessions

Room 1:  
Opening Ceremony  
**Keynote Lecture: Professor Joan Montanyà**  
*"Application of space based lightning detection in power systems"*  
08:00 to 09:45 (SAST)

Coffee Break Morning: 09:45 - 10:15

Room 1: Lightning Physics and Discharge				Room 2: Protection and Performance of Transmission and Distribution Lines 1			
Time (SAST)	Paper ID	Title	Authors	Time (SAST)	Paper ID	Title	Authors
10:15	103	Understanding of leader propagation for long gaps with large electrodes under positive switching impulses	Liliana Arevalo, Oscar Diaz, Yury Solovyev	10:15	14	A review of the relationship between peak currents of the first and subsequent strokes in the same flash	Gerhard Diendorfer, Fabio Bologna, Christiaan Engelbrecht
10:30	84	New discoveries from laboratory experiments in long air gaps: implications on lightning physics <b>(Virtual Presentation)</b>	Marley Becerra, Xiangen Zhao, Vladimir Rakov	10:30	21	Influence of Different Types of Strokes and Multiple Strike Points on the Lightning Performance of Overhead Distribution Lines	Martino Nicora, Daniele Mestriner, Massimo Brignone, Renato Procopio, Elisabetta Fiori, Alexandre Piantini, Farhad Rachidi
10:45	125	Comparative analysis for inception of positive connecting leader from a cruising and grounded aircraft	Sayantan Das, Udaya Kumar	10:45	116	The Effect of Cloud-to-Cloud Lightning on Medium Voltage Lines	Willem Dirkse van Schalkwyk, Chandima Gomes, John van Coller
11:00	89	A new approach to studying energetic radiation from thunderstorms and lightning <b>(Virtual Presentation)</b>	Istvan Kereszty, Vladimir Rakov, Attila Gulyas, Ziqin Ding, Teruaki Enoto, Yuuki Wada	11:00	143	Shutdowns of 220 kV and 400 kV power transmission lines caused by winter lightning strikes in Poland in 2022	Krzysztof Lenarczyk, Marek Loboda
11:15	102	Study of streamer discharges as a finitely conducting channel <b>(Virtual Presentation)</b>	Hasupama Jayasinghe, Vernon Cooray, Liliana Arevalo, Mats Leijon	11:15	204	Constraints on the Application of Cumulative Peak-Current Distributions for the Assessment of the Lightning Performance of Transmission Lines	Fernando Henrique Silveira, Frederico Almeida, Silverio Visacro
11:30	231	Numerical analysis of the criteria in arc root jump in lightning sweeping on resistive surface <b>(Virtual Presentation)</b>	Yakun Liu	11:30	240	Lightning Attractivity of Transmission Lines According to the Bipolar Leader Approach	Silverio Visacro, Gabriel Almeida, Maria Cecilia Lacerda, Fernando Henrique Silveira
11:45	235	Research of femtosecond laser guiding negative leader discharges in long air gap <b>(Virtual Presentation)</b>	Zhehao Pei, Weijiang Chen, Shengxin Huang, Qiaogen Zhang, Xiaosong Liu	11:45	249	Impact of Subsequent Strokes on Backflashover Rate Revisited: Influence of the Accurate Representation of Tower-foot Grounding <b>(Virtual Presentation)</b>	Joyce Guilherme, Rafael Alipio

Lunch Break: 12:00 - 13:00

# ICLP<sub>2022</sub>

## SOUTH AFRICA



### Monday 3 October 2022 - Afternoon Session 1

Room 1: Lightning Discharge and Attachment				Room 2: Earthing for Transmission Lines			
Time (SAST)	Paper ID	Title	Authors	Time (SAST)	Paper ID	Title	Authors
13:00	153	EMC considerations for JLRL direct lightning current measurement	José Claudio Silva, Carina Schumann, Hugh Hunt, Marcelo Saba, Marley Becerra	13:00	243	Lightning Response of Tower Footing Electrodes: Fundaments and Measurements	Silverio Visacro, Barbara Pereira, Fernando Henrique Silveira
13:15	170	Lightning striking process to woodpoles and trees - A review paper	Hendri Geldenhuys, Hugh Hunt	13:15	241	Understanding the Influence of Corona Effect on the Occurrence of Backflashover in Transmission Lines	Silverio Visacro, Fernando Henrique Silveira, Barbara Pereira, Sany Macedo
13:30	217	Small scale simulation of lightning using vertical wires deployed by drones: on the land and sea peak current asymetry	Joan Montanya, Pol Fontanes, Marcelo Arcanjo, Michele Urbani, Earle Williams, David Romero, Ricard Horta, Jesús A. López, Oscar van der Velde, Nicolau Pineda,	13:30	220	An investigation into the impact of tower height variation on transmission line performance considering different probability distribution <b>(Virtual Presentation)</b>	Daiane Conceição, Ivan J. S. Lopes, Rafael Alipio
13:45	43	Development Process of Lightning Stroke on Wind Turbine Based on High-Speed Camera Observation <b>(Virtual Presentation)</b>	Li Cai, Yifeng Ke, Wangxiang Chu, Wei Liu, Mi Zhou, Jianguo Wang	13:45	226	A Discussion on How to Consider the Statistical Distribution of Tower-foot Resistance Values on Lightning Performance Calculations <b>(Virtual Presentation)</b>	Rafael Alípio, Verônica Sobrinho De Souza, Fernando Almeida Diniz, Felipe Vasconcellos, William A. Chisholm, Fernando Moreira
14:00	252	Lightning measurements performed in common buildings at CEFET-MG: preliminary results <b>(Virtual Presentation)</b>	Miguel Guimaraes Neto, Listz Simões, Rafael Alipio, André Lellis, Lucas Guimarães, Marcelo M. F. Saba, Tagianne P. Silva, Marcelo Arcanjo, Istvan Kereszy	14:00	54	A Simplified Dynamic Surge Impedance Model with Corona Effect for Grounding Down-Leads of Composite Pylons <b>(Virtual Presentation)</b>	Hanchi Zhang, Kai Yin, Kye Yak See, Qian Wang, Filipe da Silva, Claus Leth Bak
14:15	215	Analysis of the Fractal Dimension of Lightning Discharges based on a Stochastic Lightning Attachment Simulation Model <b>(Virtual Presentation)</b>	Alexios Ioannidis, Zacharias Datsios, Georgios Tsaousakis, Thomas Tsovilis	14:15	110	Characterization of the Energized Transmission Line Towers Grounding: an approach in time and frequency domains <b>(Virtual Presentation)</b>	Amanda Botelho Amaral, Carlos Ermídio Ferreira Caetano, José Osvaldo Saldanha Paulino, Marco Aurélio de Oliveira Schroeder

Coffee Break Afternoon: 14:45 - 15:15



**Monday 3 October 2022 - Afternoon Session 2**

Room 1: LEMP - Return Stroke Modelling				Room 2: Power System Protection and Analysis			
Time (SAST)	Paper ID	Title	Authors	Time (SAST)	Paper ID	Title	Authors
15:15	17	FDTD simulations of lightning strikes to the Gaisberg Tower: Comparison with ALDIS sensor measurements and evaluation of the Gaisberg radiation pattern	Hannes Kohlmann, Wolfgang Schulz, Farhad Rachidi	15:15	68	A Novel Estimation of the Damage Rate of Surge Arresters Due to Lightning Stroke in a Distribution Network <b>(Virtual Presentation)</b>	Jinxin Cao, Yaping Du, Yuxuan Ding, Zhe Li, Yang Zhang
15:30	70	Return Stroke Model Comparison Using Lightning Currents to the Sentech Tower, South Africa	Jason R Smit, Hugh GP Hunt, Carina Schumann	15:30	88	Distribution Network Impact Assessment with Geometrically Identified Strike Points: An Approach	Nasib Khadka, Diwakar Bista, Chandima Gomes, Shirram Sharma, Brijesh Adhikary
15:45	20	Representation of slow-front lightning currents using a new channel-base function	Daniele Mestriner, Massimo Brignone, Renato Procopio, Alexandre Piantini, Farhad Rachidi, Federico Delfino	15:45	119	Differentiated Lightning Protection Method for Power Transmission Lines Based on Bayesian Decision Method	Guohua Yang, Zicheng Li
16:00	268	Evaluation of Ground Parameters on Lightning-Induced Over-Voltages Considering Various Return Stroke Models	Noor Ul Ain, Farhan Mahmood, Amna Shoukat, Mohammad E. M. Rizk	16:00	136	Research on Electromechanical Disturbance Propagation Control for AC Interconnected Area Power Grids under Lightning Stroke	Xia Hua, Chong Tong, Liang Wang, Yi Hong, Jiahuan Feng, Zhihao Fang, Jinwen Mai, Xujiang Shi, Yang Xu
16:15	194	A Simplified Time Domain Approach to Calculate Lightning Electric Fields Considering the Grounded Tower-Line-Tower Structures <b>(Virtual Presentation)</b>	Quanxin Li, Jianguo Wang, Jinliang He	16:15	236	Processing and Visualisation Methodologies for Lightning and Outage Related Big Data in an Effort to Improve Maintenance and Operations within an Electrical Power Utility	Renier Van Rooyen, Hugh Hunt, Gavin Strelec
16:30	190	Analysis of Lightning Current Using Electromagnetic Models and 3D-FDTD Method in Presence of Tall Object <b>(Virtual Presentation)</b>	Mohamed Abdelghani Talbi, Kaddour Arzag, Zin-Eddine Azzouz	16:30	265	A Neural Network Based Prediction Model for Lightning Induced Over-Voltages on Overhead Lines Considering the Soil Electrical Parameters	Noor Ul Ain, Farhan Mahmood, Mohammad E. M. Rizk



# ICLP<sub>2022</sub> SOUTH AFRICA



## Tuesday 4 October 2022 - Morning Session 1

Room 1: LEMP - Applications				Room 2: Protection of Renewable Energy Systems 1			
Time (SAST)	Paper ID	Title	Authors	Time (SAST)	Paper ID	Title	Authors
08:00	184	Relation of Lightning Induced Flashovers with Stroke Distance and Current Peak	Fabio Tossani, Fabio Napolitano, Chong Tong, Alberto Borghetti, Carlo Alberto Nucci	08:00	16	External Lightning Protection and Earthing to Reduce Stress on SPDs within Electrical Equipment in Photovoltaic Plants	Ivan Grobelaar, Steven Weber
08:15	156	Lightning Induced Voltage: A Comparison Between Mathematical Modelling and Measurements on reduced Scale Structures of Offshore Oil Platforms	Antonio Roberto Panicali, Eduardo Ferreira da Costa, Ricardo Hiroshi Minoda, Milton Shighihara, Felipe Ricordi Gismonti Guimarães, Carlos Andre Carreiro Cavaliere, Vinicius Zimmermann Silva, Marcos Leonardo Ramos	08:15	36	Analysis of lightning protection of floating photovoltaic power plant	Konrad Sobolewski, Emilia Sobieska
08:30	142	Identification of Suitable Governing Equation for Electromagnetic Fields in Aircrafts During a Lightning Strike	Surekha Jonnalagadda, Udaya Kumar	08:30	44	Lightning-induced overvoltage protection for microinverters using surge protective devices	Simisi Mosamane, Chandima Gomes
08:45	186	Application of FDTD for the Assessment of the Lightning Response of Grounding Electrodes Considering the Frequency Dependence of Soil Parameters	Kelvin de A. Carvalho, Fernando H. Silveira	08:45	55	Lightning Overvoltages and Transient Ground Potential Rises in large PV plants	François Grange, Sébastien Journet, Farid Paul Da Walibi, Zainal Kadir
09:00	188	On the Influence of Multigrounded Conductors on the Performance of Compact Distribution Lines Against Nearby Lightning Strikes <b>(Virtual Presentation)</b>	Larissa L. P. Lima, Alberto De Conti, Osís E. S. Leal	09:00	162	Dynamic Lightning Protection of Microgrids with High Proportion of Photovoltaic Power Generation	Jinwen Mai, Chong Tong, Yuetao Wu, Yang Xu, Yi Hong, Xia Hua, Jiahuan Feng, Zhihao Fang, Xujiang Shi, Huijuan Lin
09:15	253	A practical deconvolution approach to obtain lightning electric field profiles: preliminary results <b>(Virtual Presentation)</b>	Listz Araújo, Miguel Guimarães, Rafael Alipio, Thiago Soares, Karine de Freitas, Marcelo Saba, Tagianne Silva, Rafael Maia, Istvan Kereszy	09:15	87	Simulation and Analysis of Surge Protection for Wind Turbines Based on ATP-EMTP <b>(Virtual Presentation)</b>	Zewei Zhu, Mai Jiang, Vincent Crevenat
Coffee Break Morning: 09:45 - 10:15							



### Tuesday 4 October 2022 - Morning Session 2

Room 1: Testing - Laboratory Experiments 1				Room 2: Protection of Renewable Energy Systems 2			
Time (SAST)	Paper ID	Title	Authors	Time (SAST)	Paper ID	Title	Authors
10:15	270	Highly Efficient Portable Lightning Strike Counter – Case Study of Its Implementation and Testing	Jan Mikeš, Pavel Kovář	10:15	129	Calculation of Lightning Current Distribution within a Wind Turbine and its Surge Protection	Eduard Shulzhenko, Kazuo Yamamoto, Michael Rock
10:30	138	The importance of lightning impulse polarity in transformer liquid insulation	Carl Wolmarans, Carina Schumann, Marcelo Saba, Cuthbert Nyamupangedengu	10:30	173	Earthing systems for charging infrastructures - impact in case of lightning incidents	Josef Birkel, Eduard Shulzhenko
10:45	112	A comparative study on the performance of nickel-based technologies for lightning strike protection of composite aircraft	Jean Langot, Etienne Gourcerol, Anamaria Serbescu, David Brassard, Kambiz Chizari, Maxime Lapalme, Alexandra Desautels, Frédéric Sirois, Daniel Therriault	10:45	131	Dynamic lightning protection mode of smart grid considering charging and discharging of electric vehicles	Yi Hong, Chong Tong, Xia Hua, Jiahuan Feng, Zhihao Fang, Jinwen Mai, Xujiang Shi, Yang Xu, Yuetao Wu
11:00	130	Measurement of Magnetic Fields Generated by a Lightning Current Flowing Through Reinforced Concrete Walls	Susana Naranjo Villamil, Julien Gazave, Eric Piedallu, Maud Franchet, Boris Marquois, Christophe Guiffaut, Alain Reineix	11:00	38	Influence of Lightning Strike on Availability of Wind Turbine and its Damage Analysis <b>(Virtual Presentation)</b>	Kazuo Yamamoto, Hiroaki Kazui, Shota Izuchi
11:15	250	An Experimental Validation of the Bergeron Transmission Line Model Applied to Rotor Blades During Lightning	Yarú Méndez	11:15	41	Overvoltages on a Photovoltaic Park Grounding System Exposed to Lightning Strike <b>(Virtual Presentation)</b>	Despoina Koukoumpa, Konstantinos Koutras, Georgios Peppas, Ioannis Naxakis, Eleftheria Pyrgioti
11:30	180	Observation of isolated heating segments ahead of the discharge channel under positive and negative lightning impulses <b>(Virtual Presentation)</b>	Xiangen Zhao, Quan Gan, Yaping Du, Juhyeong Lee, Zhe Li, Xiankang Wang, Yang Liu, Xiaopeng Liu, Junjia He	11:30	210	Investigation of Lightning Effects in an Offshore Wind Farm <b>(Virtual Presentation)</b>	Christiana Kritikou, Sokratis Pastromas, Konstantinos Koutras, Georgios Peppas, Eleftheria Pyrgioti

Lunch Break: 12:00 - 13:00



**Tuesday 4 October 2022 - Afternoon Session 1**

Room 1: Testing - Laboratory Experiments 2				Room 2: Down Conductors and Earthing			
Time (SAST)	Paper ID	Title	Authors	Time (SAST)	Paper ID	Title	Authors
13:00	133	Preliminary experimental developments in arrangements of photovoltaic modules affected by lightning	Helio Sueta, Jobson Modena, José Barbosa, Sergio Santos, Roberto Zilles	13:00	141	An investigation of lightning impulse on earthing materials and fulgurites formation	Arunima Shukla, Vikas Almadi, Bernd Moosburger, Josef Birkel, Ralph Brocke, Sunil Saini, Devesh Jaiswal
13:15	59	Drone-Triggered Lightning: The Concept and Results of Initial Laboratory Testing	Nishanth Parus, Chandima Gomes	13:15	72	Study of alternatives for replacing the intermediate interconnection rings of the down-conductors <b>(Virtual Presentation)</b>	Biagione Araujo
13:30	134	Experimental developments in steel cables used as horizontal lifelines hit by lightning	Helio Sueta, Jobson Modena, José Barbosa, Roberto Zilles	13:30	90	Estimation of Actual Earth Resistance in Complex Earthing Networks -A Case Study for Telecom Towers <b>(Virtual Presentation)</b>	Dasitha Liyanage, Asanka Rodrigo
13:45	33	Construction of a low-ohmic coaxial resistor made of conductive fabric <b>(Virtual Presentation)</b>	Nicolas Enriquez Menjura, Daniel Alejandro Lindo Parada, Jorge Enrique Rodriguez Manrique, Francisco José Román Campos	13:45	207	The Ground Potential Distribution around Grounding grids under a Direct Lightning Strike <b>(Virtual Presentation)</b>	Zhe Li, Yuxuan Ding, Jinxin Cao, Yaping Du, Chuanzhen Jia, Xiangen Zhao
14:00	104	Silver-based conductive materials for lightning strike protection of aircraft composite structures <b>(Virtual Presentation)</b>	Anamaria Serbescu, David Brassard, Jean Langot, Etienne Gourcerol, Daniel Theriault, Frédéric Sirois, Kambiz Chizari, Maxime Lapalme, Alexandra Desautels	14:00	11	The use of hydrogels in mixtures to reduce the transient resistance of the soil - grounding device <b>(Virtual Presentation)</b>	Siarhei Baraishuk, Ivan Paulovich, Alexey Skripko
Coffee Break Afternoon: 14:45 - 15:15							
Poster Session Venue: Exhibition Hall 14:45 to 17:00 (SAST) See next page for Paper IDs							
Lion Dinner Details at: <a href="https://www.iclp2022.org/social-events">https://www.iclp2022.org/social-events</a> 18:00 to 22:00							



**Tuesday 4 October 2022 - Poster Session**

Paper ID	Title	Authors	Paper ID	Title	Authors
3	Arizona lightning occurrence, casualties, and damages	Ronald Holle, Daile Zhang	73	Lightning Safety with a Grounded Air-Terminal: Is there a Difference between Indoor and Outdoor?	Chandima Gomes, Zmnako Mohammed Khurshid
4	The epidemiology of lightning in Mainland China – A review of two datasets from the 1950s to 2018	Daile Zhang, Ronald Holle	98	Method for detection and identification of lightning strokes likely to cause wildfires	Gavin Strelec, Anton Kunneke, Frans Jooste
23	Detection and early warning of lightning and extreme storm events in KwaZulu-Natal, South Africa.	Maqsooda Mahomed, Alistair David Clulow, Tafadzwanashe Mabhaudhi, Michael John Savage, Kershani Tinisha Chetty, Sheldon Strydom	107	An analysis of lightning deaths in Brazil 2010-2020	Danilo de Souza, Walter Martins Júnior, Edson Martinho, Hélio Sueta, Hédio Tatizawa
28	Modelling of Streamer Breakdown in a 0.1 cm Air Gap using Positive Polarity DC in Subtropical Conditions	Keshlan Moodley, Andrew Swanson	118	Post Mortem Engineering Perspectives on Two Giraffes Killed by Lightning	Pieter H Pretorius, Ciska P J Scheijen
30	Test circuit for evaluation of physical characteristics of SPDs with combined DC and impulse load	Christian Drebenstedt Drebenstedt, Stefan Jugelt, Michael Rock	122	Ground Flash Density Map for Mauritius and its Use for Improving the Lightning Performance of Transmission Lines	Ismael Essackjee
32	Lightning Impact on Human Modeled by Network with Lumped Elements	Michael Rock, Christian Drebenstedt	127	Occurrence of dangerous touch voltages during lightning strikes	Martin Hannig, Ralph Brocke, Eduard Shulzhenko
52	Warning of lightning risk for the first lightning produced by a thunderstorm using electric field mill network records	Franciane Rodrigues, Moacir Lacerda	132	Vulnerability warning method of power grid considering dynamic lightning protection	Jiahuan Feng, Zhijian Wu, Zhihao Fang, Chong Tong, Jinwen Mai, Xujiang Shi, Yi Hong, Yang Xu, Xia Hua, Liudi Fu,
58	Simulation of the atmospheric electric field and current structure for sensors with different geometry in relation to the electric current measured in the external circuit	Konrad Sobolewski, Marek Kubicki	135	Survey to analyze the general knowledge of Brazilians about lightning	Helio Sueta, Jobson Modena, José Barbosa, Roberto Zilles, Miltom Shigihara
61	Influence of Grounding Wires on Measured Frequency-Dependent Soil Properties	Evgeniya Borozdina, Dmitry Kuklin	140	A study to understand the effect of Backfill Coating on Cu-bonded Electrodes	Arunima Shukla, Vikas Almadi, Sunil Saini, Devesh Jaiswal
67	Research on the lightning damage control of power systems based on real-time lightning detection and probability prediction	Yang Xu, Chong Tong, Jian Xu, Yi Hong, Xia Hua, Yaokun Zou, Jiahuan Feng, Zhihao Fang, Jinwen Mai	151	Reverse Operation of Surge Protective Devices on RS 485 Communication Lines Under Lightning Ground Potential Rise	Pieter H Pretorius





**Tuesday 4 October 2022 - Poster Session (cont.)**

Paper ID	Title	Authors	Paper ID	Title	Authors
165	Improvement of Control Loop Bandwidth of UPFC in Dynamic Lightning Protection System	Zhihao Fang, Zhijian Wu, Jinwen Mai, Xujiang Shi, Yang Xu, Yi Hong, Xia Hua, Jiahuan Feng, Chong Tong, Tao Hu	187	On Lightning Ground Potential Rise and Wire-Line Communications in Large Utility Scale PV Plant	Pieter H Pretorius
168	Using machine learning to identify lightning in paintings	Jason Ziemons, Sansha Gupta, Estelle Trengove	197	Teaching lightning safety at schools - an Australian perspective	Andrew McKenzie
174	A Short-term Electricity Load Clustering Method Based on the Influence of the Lightning Weather to the Power Grid	Yang Xu, Xuebao Jiang, Chong Tong, Liudi Fu, Jianqiang Miao, Xujiang Shi, Huijuan Lin	205	A Linear Optimal Power Flow Method for Lightning Protection Based on Lightning Early Warning	Yu Zhou, Chong Tong, Minlei Li, Hui Chen, Kunming Wu, Ruopei Zhan, Min Xiang
176	Lightning Protection System for a Rhino Boma – Design Considerations	Pieter H Pretorius	211	Monitoring the lightning activity by using the platform YANSA for emission warning of lightning risk in real-time with electric field mill network	Moacir Lacerda, Franciane Rodrigues, Carlos Augusto Morales Rodriguez, Robson Jaques Verily
177	Dynamic Lightning Protection of PET embedded AC/DC hybrid distribution network	Xujiang Shi, Chong Tong, Xiaoming Pan, Jinwen Mai, Yang Xu, Yi Hong, Xia Hua, Jiahuan Feng, Zhihao Fang	224	Backfill Materials for Enhancing the Performance of Electrical Grounding Systems: An Analytical Revisit	Muhammad Qasim Abdul Sattar, Chandima Gomes
178	On Failed Attachment of a Lightning Strike to an Air Termination Rod in a Large Utility Scale PV Plant	Pieter H Pretorius, Massimiliano Salaorno	227	Archaeological sites in Nepal and India: Concerns of lightning risks	Shriyog Sharma, Shri Ram Sharma, Chandima Gomes
179	A Flexible DC System Control Strategy to Reduce Strike Impact Based on Lightning Early Warning	Ruopei Zhan, Zhijian Wu, Yu Zhou, Kunming Wu, Chong Tong, Min Xiang	232	Protection of Medium Voltage Pole-mount Installations Against Lightning	Willem Dirkse van Schalkwyk, Mandri van der Mescht, Christo van der Mescht
183	Lightning Ground Potential Rise - A Contributing Factor to Damage Associated with Wind Turbine Blades	Pieter H Pretorius	238	Promoting Lightning Safety inside School Articulation Programs at the Colombian National Training Service (SENA)	Omar A Rodriguez, Omar C Rocha, Katerine Morcillo, Daniel E Villamil



Wednesday 5 October 2022 - Morning Session 1

Room 1: Tall Tower Studies				Room 2: Protection of Infrastructure			
Time (SAST)	Paper ID	Title	Authors	Time (SAST)	Paper ID	Title	Authors
Room 1: <b>Invited Lecture: Dr Hendri Geldenhuys</b> <b>"Lightning Research in South Africa"</b> 08:00 to 08:30 (SAST)							
08:30	155	Lightning interaction with tall structures in tropical zones	Steven Ardila, Edison Soto, Jesús López, Joan Montanya	08:00	146	Performance Evaluation of Non-Conventional Lightning Protection Systems Based on NLDN Data	Carlos Mata, Jonathan Hill
08:45	42	Optical Observations of 99 Upward Flashes in Johannesburg, South Africa	Carina Schumann, Hugh G. P. Hunt, Jason Smitt, Tom A. Warner	08:15	172	Reduced separation distance in structures with metallic framewok or reinforced concrete framework	Josef Birkel, Fridolin Heidler, Alexander Kern
09:00	46	Analyses of Ground Truth Data for Positive Flashes	Lukas Schwalt, Stephan Pack, Wolfgang Schulz	08:30	191	Managing complexity for effective and resilient lightning safety and protection	Ian McKechnie, Ian Jandrell
09:15	2	Thunderstorm types and meteorological characteristics of upward lightning <b>(Virtual Presentation)</b>	Isabell Stucke, Deborah Morgenstern, Gerhard Diendorfer, Georg J. Mayr, Hannes Pichler, Wolfgang Schulz, Thorsten Simon, Achim Zeileis	08:45	22	Lightning Risk Assessment of Pipelines Insulating Flanges with Isolating Spark-Gap <b>(Virtual Presentation)</b>	Andreas Dimitriou, Christos Melios, Nikolaos Kokkinos, Charalambos Charalambous
09:30	25	Changes in the Number of Lightning Strokes due to the Construction of New Wind Farms <b>(Virtual Presentation)</b>	Michihiro Matsui, Koji Michishita, Shigeru Yokoyama, Nobuyuki Honjo	09:00	29	Explosive Damages of Structures Due to Winter Lightning <b>(Virtual Presentation)</b>	Hidetoshi Ito, Shigeru Yokoyama, Michihiro Matsui, Tomoyuki Sato
Coffee Break Morning: 09:45 - 10:15							



**Wednesday 5 October 2022 - Morning Session 2**

Room 1: Lightning Occurrence Characteristics 1				Room 2: Protection and Performance of Transmission and Distribution Lines 2			
Time (SAST)	Paper ID	Title	Authors	Time (SAST)	Paper ID	Title	Authors
10:15	245	Incidence of Lightning Strikes to Power Transmission Lines in the South of Brazil: Current and Future Climate	Kleber Naccarato, Ana Santos, Francisco Lima	10:15	13	A methodology for quantifying the variability of transmission lines lightning outage rates	Christiaan Engelbrecht, Gerhard Diendorfer, Fabio Bologna
10:30	160	MERLIN Low Detection Efficiency Study Results: First Two Years	Jonathan Hill, Carlos Mata	10:30	75	Analysis of Lightning Fault on Actual Distribution Line in Summer <b>(Virtual Presentation)</b>	Koji Michishita, Tatsuro Akimoto, Shigeru Yokoyama, Koji Takano, Masateru Ikuta
10:45	48	Analysis of Monthly Lightning Distribution in Nigeria <b>(Virtual Presentation)</b>	Chinemere Eberechukwu Anyiam, Michael Omidiora, Isaac Samuel, Ronald L Holle	10:45	139	Backflashover Caused by Lightning Strokes Along the Span	Gonçalo Inácio, Maria Teresa Correia de Barros, Andreia Leiria
11:00	200	Calculating the maximum lightning current amplitudes with the different annual return period	Vladimir Djurica, Goran Milev, Klemen Jevnikar, Boris Žitnik	11:00	34	Outages of Overhead Power Lines Caused by Energy in Lightning Itself and the Mitigation Methods <b>(Virtual Presentation)</b>	Shigeru Yokoyama, Tomoyuki Sato, Hidetoshi Ito, Michihiro Matsui
11:15	219	Analysis of Peak Currents Reported by the Swedish Lightning Location System During 2015-2020 <b>(Virtual Presentation)</b>	Rebecca Persson, Mahbubur Rahman, Per Westerlund, Milan Radosavljević, Stefan Ståhl, Göran Ericsson	11:15	152	Flashover rate of an overhead line located on a steeped terrain	Edison Soto, Steven Ardila, Diego Del Río
11:30	150	Processes in –CG lightning flashes detected from space by GLM: A ground-truth study in the Amazon <b>(Virtual Presentation)</b>	Adonis Leal, Vladimir Rakov	11:30	213	Effects of Lightning Current Waveform on the Fast-Front Overvoltages and Critical Currents Causing Insulation Flashover to a 150 kV Overhead Transmission Line <b>(Virtual Presentation)</b>	Zacharias G. Datsios, Diamantis G. Patsalis, Pantelis N. Mikropoulos, Thomas E. Tsovilis
Lunch Break: 12:00 - 13:00							



### Wednesday 5 October 2022 - Afternoon Session 1

Room 1: Lightning Occurrence Characteristics 2				Room 2: Modelling of Soil Resistivity			
Time (SAST)	Paper ID	Title	Authors	Time (SAST)	Paper ID	Title	Authors
13:00	261	Lightning Characteristics Analysis Affected by Topographic Factors in Yunnan Province <b>(Virtual Presentation)</b>	Binghao Li, Jinqiang He, Jianwei Cheng, Xi Zhang, Jiahui Yang, Wenhao Li	13:00	18	FDTD Analysis of Measuring Frequency-Dependent Properties Using Soil Samples	Dmitry Kuklin
13:15	79	Development of an Interferometer-type Lightning Mapping Array System <b>(Virtual Presentation)</b>	Junchen Yang, Daohong Wang, Haitao Huang, Ting Wu, Nobuyuki Takagi, Kazuo Yamatomo	13:15	37	Considerations on Earthing Impedance Measurement using Low-magnitude Variable-frequency Current	Omar Kherif, Stephen Robson, Noureddine Harid, David Thorpe, Abderrahmane Haddad
13:30	247	Study of the correlation between lightning activity and convective rain over Equatorial Africa <b>(Virtual Presentation)</b>	Emmanuel Ndiadia Kandolo, Paulo Rostha Lohalo, Francois Tondozi Keto, Jean Marie Tshitenge Mbuebue, Jean Claude Kayembe Kalombo, Edmond Phuku Phuati	13:30	223	On the Impact of Soil Resistivity Measurement and Modelling on Grounding Performance	Omar Kherif, Stephen Robson, Noureddine Harid, Silvio Stivanello, David Thorpe, Abderrahmane Haddad
13:45	248	Comparative study of lightning activity over north vs south Equatorial Africa <b>(Virtual Presentation)</b>	Emmanuel Ndiadia Kandolo, Paulo Rostha Lohalo, Francois Tondozi Keto, Jean Marie Tshitenge Mbuebue, Jean Claude Kayembe Kalombo, Edmond Phuku Phuati	13:45	230	Evaluation of a Lossy Dispersive Soil in the Transient Analysis of Multiconductor Underground Cable Systems <b>(Virtual Presentation)</b>	Naiara Duarte, Alberto De Conti, Rafael Alipio
14:00	24	Tropical Lightning Peak Current Measurement in West Java, Indonesia <b>(Virtual Presentation)</b>	Bryan Denov, Syarif Hidayat, Suwarno Suwarno, Reynaldo Zoro	14:00	234	Equations for predicting the volumetric water content affecting the resistivity of soil in the vicinity of a driven earth electrode in variably saturated homogeneous soil	Samuel Onyedikachi, Chandima Gomes, John van Coller
14:15				14:15	12	FDTD Computation of Lightning-induced Surges in a Reinforced-Concrete Apartment Building <b>(Virtual Presentation)</b>	Atsuya Kawaguchi, Yoshihiro Baba, Naoto Nagaoka, Mikihisa Saito

Coffee Break Afternoon: 14:45 - 15:15





Wednesday 5 October 2022 - Afternoon Session 2

Room 1: Nowcasting and AI				Room 2: Testing - Standards			
Time (SAST)	Paper ID	Title	Authors	Time (SAST)	Paper ID	Title	Authors
15:15	117	Thunderstorm Warning Systems Efficiency	Alain Rousseau, Stéphane Schmitt	15:15	19	Sensitivity Analysis of the Parameters for Lightning Risk Assessment	Chun Lim Siow, Omar Abdelaziz Hashim Mohamed, Chandima Gomes
15:30	106	Lightning Warning Prediction with Multi-source Data	Marcos A. Alves, Bruno A. S. Oliveira, Willian Maia, Waterson S. Soares, Douglas S. Ferreira, Ana Paula Paes Santos, Fernando P. Silvestrow, Eugenio L. Daher, Osmar Pinto Junior	15:30	216	Risk Assessment of Rooftop-Mounted Solar PV Systems	Amesh A. E. Gomes, Alain Rousseau, Mitchell Guthrie, Alexis Barwise, Chandima Gomes
15:45	49	Prediction of Lightning Severity by LSTM Neural Network variants from Remote Sensing Instruments in South Africa: 2016-2015	Yaseen Essa, Hugh G. P. Hunt, Morné Gijben, Ritesh Ajoodha	15:45	225	Challenges in Conducting Risk Assessment and Designing Protection Measures as per IEC 62305	Amesh A. E. Gomes, Chandima Gomes
16:00	123	Machine Learning Based Lightning Nowcasting using Single-Site Meteorological Observations and Lightning Location Systems Data	Amirhossein Mostajabi, Ehsan Mansouri, Marcos Rubinstein, Chong Tong, Farhad Rachidi	16:00	115	Lightning Risk Assessment-Next Steps	Alain Rousseau, Anthony Bergot, Stéphane Schmitt, Stéphane Pedebay, Fernanda Cruz
16:15	76	Identification of Cloud-to-Ground and Intracloud Lightning Based on Electric Field Registration and Neural Network Approach <b>(Virtual Presentation)</b>	Grzegorz Karnas, Grzegorz Dralus, Grzegorz Maslowski	16:15	83	Ubiquitous and Perplexing Proliferation of Non-standard Lightning Protection System in Developing Countries	Shriram Sharma, Chandima Gomes, S. Gopa Kumar, Foster Chileshe Lubasi
16:30	203	Short-term lightning prediction in the Amazon region using ground-based weather station data and machine learning techniques <b>(Virtual Presentation)</b>	Adonis Leal, Wendler Matos	16:30	66	Study of kc coefficient values established in the Brazilian and International Standards for Lightning Protection Systems <b>(Virtual Presentation)</b>	Biagione Araujo



Thursday 6 October 2022 - Morning Session 1

Room 1: Flash, Strokes and GSPs				Room 2: Protection of Infrastructure 2			
Time (SAST)	Paper ID	Title	Authors	Time (SAST)	Paper ID	Title	Authors
08:00	45	Global ground strike point characteristics in negative downward lightning flashes	Dieter Poelman, Wolfgang Schulz, Stephane Pedeboy, Dustin Hill, Marcelo Saba, Hugh Hunt, Lukas Schwalt, Carina Schumann, Tom Warner	08:00	77	Comparison of the Analytical Simplified Method of the OHL Lightning Performance Assessment with Monte Carlo Method in ATP-EMTP using Line Lightning Protection Devices	Dmitriy Belko, Nikolay Zaretskiy
08:15	50	Ground Strike Point Density Map of South Africa	Sanele Gcaba, Hugh Hunt	08:15	100	Review of lightning impacts on power supply of productive and extractive industry in South Africa and such ways of production loss mitigation as installation of line lightning protection devices	Elizabeth Piskliukova, Dmitriy Belko
08:30	57	A Bayesian Approach to Determining Ground Strike Points in LLS Data	Wandile Lesejane, Hugh Hunt, Carina Schumann, Ritesh Ajoodha	08:30	154	Application of numerical simulations for improvement of line lightning protection device operation efficiency	Alexander Chusov
08:45	109	Experimental Evaluation of The Lightning Flash Multiplicity in a Mountainous Region in Colombia	Javier Herrera-Murcia, Diana Rincón, Camilo Younes-Velosa, Daniel Aranguren	08:45	40	Improved Parameters for Lightning Protection System Designs for Buildings in Zambia <b>(Virtual Presentation)</b>	Shadreck Mpanga, Ackim Zulu, Mabvuto Mwanza, Ronald Holle
09:00	128	Investigating the Relationship between Nigerian Rainfall Climatology and Lightning Stroke Distribution <b>(Virtual Presentation)</b>	Michael Omidiora, Chinemere Eberchukwu Anyiam, Isaac Samuel, Ronald L Holle	09:00	209	Lightning Protection of Historical Buildings and Cultural Heritage Monuments: A Literature Review <b>(Virtual Presentation)</b>	Alexios Ioannidis, Pantelis Mikropoulos, Thomas Tsovilis, Nikolaos Kokkinos
09:15	263	A Research on Cloud-to-Ground Lightning Statistical Methods Based on LLS <b>(Virtual Presentation)</b>	Binghao Li, Jinqiang He, Yongli Liao, Hao Li, Hao Pan, Yejiang Deng	09:15	269	Enhancement of the Lightning Protection System of Floating Roof Oil Tanks by Improving its Grounding System <b>(Virtual Presentation)</b>	Wejdan Ibrahim, Riyadh Zaki
Coffee Break Morning: 09:45 - 10:15							



Thursday 6 October 2022 - Morning Session 2

Room 1: Lightning and the Environment				Room 2: Protection and Performance of Transmission and Distribution Lines 3			
Time (SAST)	Paper ID	Title	Authors	Time (SAST)	Paper ID	Title	Authors
10:15	163	Volcanic Lightning: A Lesser-Considered Lightning Safety Hazard <b>(Virtual Presentation)</b>	Chris Vagasky, Janine Krippner	10:15	5	Multi-Chamber Arresters of a New Type for Protection Overhead Lines 10kV and 13.8 kV Against Induced Overvoltages.	Georgy Podporokin, Iliya Filippov, Urij Kretov
10:30	108	Does pollution affect the peak lightning current? A study on the relationship between Aerosol Optical Depth and peak lightning current	Diego Del Rio, Camilo Younes Velosa, Edison Soto Rios, Daniel Aranguren Fino, Javier Herrera Murcia	10:30	97	A New Approach for Sheath Voltage Limiters in Medium Voltage systems	Olga Vlachokyriakou, George Peppas, Argiris Kagiannas, Panagiotis Raptis, Zafiris Politis, Eleftheria Pyrgioti, Ioannis Gonos
10:45	82	The possible impact of atmospheric aerosol and other factors on lightning over the rugged terrain of Nepal	Hari Bahadur KC, Shriram Sharma, Madhu Gyawali, Lok Lamsal	10:45	244	Characterization of a Medium Voltage Test Line in the Free State Province of South Africa	Andreas Beutel, Bruce McLaren, Willem Dirkse van Schalkwyk
11:00	71	Probability distributions for holdover time of lightning-caused wildfires	Jose Moris, Davide Ascoli, Hugh Hunt	11:00	144	Analysis of Lightning Overvoltages on Overhead Hybrid Lines	Luana Moraes, Alexandre Piantini, Miltom Shigihara, Alberto Borghetti, Fabio Napolitano, Carlo Alberto Nucci, Fabio Tossani
11:15	251	Magnetic evidence for lightning strikes on mountains in Lesotho as an important weathering agent	Susan Webb, Jasper Knight, Stefan Grab, Stephanie Scheiber-Enslin, Hugh Hunt, Leonie Mare	11:15	169	The Effect of Power-Frequency Voltage on the Assessment of Backflashover Occurrence of Transmission Lines: A Monte Carlo Approach	Frederico Almeida, Fernando Henrique Silveira, Silverio Visacro
11:30	262	A Correlation Study between Lightning Activity and Land Cover Types Based on the Apriori Algorithm <b>(Virtual Presentation)</b>	Jinqiang He, Binghao Li, Ruihai Li, Bo Gong, Hourong Zhang, Hao Pan	11:30	181	On The Use Of Counterpoise Grounding Wires And Underbuilt Wires To Improve The Lightning Performance Of Transmission Lines Over High Resistivity Soils: A Technical-Economic Analysis	Carlos Moreira, Fernando Silveira, Lgia Bittencourt, Silverio Visacro
11:45				11:45	126	Modelling of the Positive Lightning Impulse Flashover of Medium Voltage Overhead Line Insulators using ATP/EMTP <b>(Virtual Presentation)</b>	Pantelis Mikropoulos, Petros Tsouris

Lunch Break: 12:00 - 13:00

# ICLP<sub>2022</sub> SOUTH AFRICA

Thursday 6 October 2022 - Afternoon and Evening

Tour  
Details at: <https://www.iclp2022.org/social-events>  
13:00 to 17:00

Elephant Dinner  
Details at: <https://www.iclp2022.org/social-events>  
18:00 to 22:00





**Friday 7 October 2022 - Morning Session 1**

Room 1: Safety - Statistics and Awareness				Room 2: Protection of Railway Systems			
Time (SAST)	Paper ID	Title	Authors	Time (SAST)	Paper ID	Title	Authors
08:00	7	How to effectively prevent lightning-related incidents? Analysis of 215 events over Europe	Stéphane Schmitt, Ronald L. Holle, Mary Ann Cooper	08:00	93	Application specific requirements for Surge Protective Devices designed for signalling systems	Steffen Pfortner, Gernot Finis, Holger Heckler
08:15	9	Jamaica Lightning Occurrence, Damage and Casualties	Ronald Holle, Arlene Laing, John Cramer, Evan Thompson	08:15	31	DC-Surge Arresters for Railway Applications	Christoph Hippler
08:30	51	The U.S. National Lightning Safety Council's Efforts to Reduce Lightning Casualties	John Jensenius Jr, Ron Holle, Mary Ann Cooper	08:30	8	Characteristics confirmation of MOV for DC application under long-duration impulse current (Virtual Presentation)	Minoru Tsukazaki, Naoyuki Tsukamoto
08:45	145	Challenges to Lightning Safety Advocacy Programs	Mary Ann Cooper, Richard Tushemereirwe, Ronald Holle, Barnabas Akantambira, Dickens Mugabe, Isaac Tumuhimbise	08:45	26	Lifetime Estimation of ZnO Varistor for Railway Signalling Electronic Equipment based on Lightning Risk Evaluation (Virtual Presentation)	Hiroyki Fujita, Takuya Nomura, Ken Takasaki, Hideki Arai
09:00	148	Techniques Used by ACLENet in Protection of Schools in Rural Uganda	Mitchell Guthrie, Kenneth Roets, Anna Candela Garolera, Simone Striani, Taufeeq Nsamba, Scott Sweeney, Isaac Tumuhimbise, Mary Ann Cooper, Richard Tushemereirwe, Ronald L. Holle, Martin Okodi Omara	09:00	114	Study of Power Equipment Trouble Caused by Lightning in Traction Substation (Virtual Presentation)	Hiroto Amata, Takashi Suzuki, Masashi Nakahira, Akira Kato, Kentaro Takano, Hitoshi Hayashiya
09:15	164	Analysis of the Lightning Mortality Risk in the Provinces of Cundinamarca - Colombia	Daniel E. Villamil, Herbert E. Rojas, Francisco Santamaria, Ronald L. Holle, William Brooks	09:15			

Coffee Break Morning: 09:45 - 10:15



**Friday 7 October 2022 - Morning Session 1**

Room 1: Safety - Case Studies				Room 2: Testing - Human Safety			
Time (SAST)	Paper ID	Title	Authors	Time (SAST)	Paper ID	Title	Authors
10:15	6	93 Sheep Killed by Lightning	Ryan Blumenthal, Jan G Myburgh, Johan Moolman	10:15	218	Effects on the behavior of conductive fabrics under the influence of different current densities <b>(Virtual Presentation)</b>	Daniel Rodríguez M., Juan P. Correa P., Jorge E. Rodríguez M., Laura Y. Casas L., Francisco J. Romám C.
10:30	10	Lightning - A Potential Cause of House Fires during the Pre-monsoon Season: A Case Study in Nepal	Shriram Sharma, Ramji Jaisi Bhusal, Ronald L. Holle	10:30	69	High impulse current-induced bone micro-trauma: post-mortem indicator of lightning trauma?	Nicholas Bacci, Patrick Randolph-Quinney, Hugh Hunt, Ken Nixon, Jakobus Hoffman, Lunga Bam, Frikkie de Beer, Tanya Augustine
10:45	78	Investigation of Lightning Incident Killing Ten Children during Village Football Match in Uganda	Richard Tushemereirwe, Mary Ann Cooper, Martin Omara	10:45	105	Numerical simulation of permissible touch voltages in case of a lightning incidence	Martin Hannig, Ralph Brocke
11:00	101	Incidental Shock from an Indoor "Braai" - Postulates on the Source and Mechanism	Pieter H Pretorius	11:00	199	Lightning Barotrauma and Lightning Dysbarism: A Laboratory Study	Thanyani Pandelani, Ryan Blumenthal, Ken Nixon, Nicholas West, David Reinecke, Chandima Gomes
11:15	167	A 17-year retrospective review of lightning victims in Austria with focus on lightning effects	Stephan Pack, Jörg Schröttner	11:15	47	Testing embalming solution suitability for high impulse current experimentation on biological tissue	Nicholas Bacci, Patrick Randolph-Quinney, Hugh Hunt, Ken Nixon, Tanya Augustine
11:30	198	A Qualitative Research Approach to Study the Healing Powers of Plant Species against Lightning Used by South African Indigenous Communities of KwaZulu Natal Province, South Africa	Sechaba Bareetseng, Chandima Gomes	11:30	214	Personal protection against lightning using electroconductive fabrics <b>(Virtual Presentation)</b>	Jorge Alejandro Cristancho, Jorge Enrique Rodríguez, Andrés Mauricio Rojas, Francisco Roman
Room 1: Closing Ceremony 12:00 to 13:00							