

The variety of topics – ranging from modeling to engineering and application, from historical overview to hands-on technical operation - and the fact that speakers were from several different European countries - shows that the lightning community in Europe is robust and strong. The invitation of two guest experts (from Brazil and Russia) gave an additional dimension and enabled the scientists attending the WG-5 meeting to obtain further insights into the complex relationship between thunderstorms and TLEs.

WG4 Workshop, October 9, Paris

The meeting was conducted at ONERA 29 avenue de la Division Leclerc in conjunction with the MC meeting. Retrieving lightning currents characteristics from ground measurements, remote observation of lightning activity, and lightning activity as a proxy of cloud dynamic were the topics discussed.

EUROPEAN COST ACTION P18 4TH INTERNATIONAL SYMPOSIUM ON LIGHTNING PHYSICS AND EFFECTS, VIENNA, AUSTRIA, MAY 25 TO 27, 2009

A total of 60 scientists from 21 countries were participating this final COST P-18 Symposium in Vienna lasting for two and a half day. The 42 presentations (detailed symposium program and book of abstracts is attached to this report) covered all subjects of the 5 Working Groups within COST P18 action.

An invited lecture was given by Ute Ebert entitled “Streamer discharges in experiment and theory: a review of recent results”. The leader processes are fundamental for the understanding of the initiation, propagation and the final attachment of the leader to the ground striking point.

As in previous years several presentations were done by young scientist, giving them the opportunity to discuss their approaches and results with the European experts in this very specific area of research.

This year two presentations covered very interdisciplinary topics related to the physics of lightning. One presentation discussed “Lightning on the Giant Planets with Focus on Saturn”, given by G.Fischer et al. An overview about the current knowledge of lightning activity on the planets was given and lightning parameters were compared to observations on earth. A second presentation was given by B. Schalke, a neurologist, and entitled “Neurological and neuropsychological sequelae in long term lightning survivors”. This presentation described the potential injuries and long term symptoms observed by persons that have been struck by lightning. In many cases these patients suffered from symptoms which could not be explained and understood by the treating

doctors or the experts of the casualty insurance. The authors suggest that all long term survivors of a lightning strike should be repeatedly examined by medical and neuropsychological experts in lightning trauma over the years to avoid misinterpretation of apparently unexplainable neurological, neuropsychological and psychic symptoms.

SYMPOSIUM TIMETABLE

Monday May 25, 2009

Morning Session

09:00-09:50		Registration (Coffee)
09:50-10:00	Opening Session	Welcome message of R. Thottappillil, COST P18 Chair, Diendorfer, OC Chair
	Session 1	Lightning Electromagnetic Fields (Chair: C. A. Nucci)
10:00-12:00	10:00 – 10:20	Fischer G., D.A. Gurnett, W.S. Kurth, P. Zarka, A. Lecacheux, U.A. Dyudina, J.-M. Griebmeier, W.M. Farrell, M.L. Kaiser: Lightning on the Giant Planets with Focus on Saturn
	10:20 – 10:40	Borghetti A., F. Napolitano, C. A. Nucci, M. Paolone: Calculation of the Indirect-Lightning Performance of Overhead Distribution Lines
	10:40 – 11:00	Shostak V., E. Shulzhenko, D. Pavanello: Electric Field Simulation for Insulated Lightning Current Downconductor
	11:00 – 11:20	Stelmashuk V., P.J. van Deursen: Window sensor for the lightning current measurements
	11:20 – 11:40	Pichler H., G. Diendorfer, M. Mair: Some parameters of correlated current and radiated fields pulses from lightning to the Gaisberg Tower
	11:40 – 12:00	Mosaddeghi A., A. Mimouni, F. Rachidi, M. Rubinstein, G. Diendorfer, H. Pichler, D. Pavanello: Vertical and Horizontal Components of the Electric Field Associated with Lightning Strikes to the Gaisberg Tower
12:00-13:30		Lunch Break

SYMPOSIUM TIMETABLE
Monday May 25, 2009
 Afternoon Session

	Session 2	Lightning Physics (Chair: Shostak V)
13:30-15:10	13:30 – 13:50	Skarka V., N.B. Aleksic: Solitonic Nature of Lightning
	13:50 – 14:10	Arrayás M., J. L. Trueba: Motion of Electrons in Electromagnetic Knots
	14:10 – 14:30	Yordanov V., A. Blagoev: A Study of the Breakdown in the Plasma Focus Device
	14:30 – 14:50	Rubinstein M., C. Romero, F. Rachidi: Lightning Location Information From Field Peak Amplitude Attenuation
	14:50 – 15:10	Flache D., V.A. Rakov, F. Heidler, W. Zischank, R. Thottappillil: Leader/Return Stroke versus M-Component Mode of Charge Transfer to Ground in Initial-Stage Pulses of Upward Lightning
15:10-15:40	Coffee Break	
	Session 3	Lightning Protection (Chair: R. Thottappillil)
15:40-17:00	15:40 – 16:00	Shoory A., M. Paolone, F. Rachidi, A. Borghetti, C.A.Nucci: On the Application of Finite-Element Method for the Analysis of Lightning Protection of Wind Turbines
	16:00 – 16:20	Mäkelä J., E. Karvinen, N. Porjo, A. Mäkelä, T. Tuomi: Attachment of natural lightning flashes to trees
	16:20 – 16:40	Blaj A., F.B.J. Leferink: Lightning Protection of Ships on Maritime and Coastal Environment
	16:40 – 17:00	Bargboer G., A.P.J. van Deursen: Current injection on a pharmaceutical plant, measured and modelled

SYMPOSIUM TIMETABLE
Tuesday May 26, 2009
 Morning Session

	Session 4	Sprites & Jets (Chair: C. Price)
08:30-09:50	08:30 - 09:10	INVITED LECTURE Ebert U.: Streamer discharges in experiment and theory: a review of recent results
	09:10 - 09:30	Neubert T.: Status of the Atmosphere-Space Interactions Monitor (ASIM) for the International Space Station and plans for ground campaigns in 2009 and beyond
	09:30 - 09:50	Chanrion O., T. Neubert: Production of runaway electrons in conventional electric discharges
09:50-10:20	<i>Coffee Break</i>	
	Session 5	Lightning and Meteorologie (Chair: Neubert T)
10:20-12:00	10:20 - 10:40	Varga B.: Lightning Climatology – Tendencies, Extremities, Severe Weather probability based on 11 years of Central European lightning data
	10:40 - 11:00	Price C., M.Asfur, Y. Yair: Electric Hurricanes
	11:00 - 11:20	Mitzeva R., Ts. Dimitrova, B. Stoilova: Analysis of Lightning Activity and Radar Reflectivity in Multicell Convective Cloud
	11:20 - 11:40	Manoochehrnia P., C. Price, F. Rachidi, M. Rubinstein, W. Schulz: Lightning Activity Link with Temperature and Precipitation in Switzerland
	11:40 - 12:00	Gajda W., P. Barański, J. Parfiniewicz: Lightning Activity Accompanying the Supercell Event with Tornado and Two Heavy Hail Gushes – the severe weather incident in Poland on 20 July 2007
12:00-13:30	<i>Lunch Break</i>	

SYMPOSIUM TIMETABLE
Tuesday May 26, 2009
 Afternoon Session

	Session 6	Modeling (Chair: G. Satori)
13:30- 15:10	13:30 - 13:50	Javor V., P. Rancic: One Electromagnetic Model for Representing Lightning Attachment to the Lossy Ground
	13:50 - 14:10	Shoory A., F. Rachidi, M. Rubinstein, R. Moini, S.H.H. Sadeghi: A Discussion on the Inversion of Polarity of Lightning Far Electromagnetic Fields
	14:10 - 14:30	Raysaha R. B., U. Kumar: Role of Channel Conductivity and Corona Sheath on Return Stroke Current Evolution
	14:30 - 14:50	Maslowski G., J. Bajorek, P. Baranski: Modeling of shoulders within the lightning current front assuming generation of two waves in attachment point
	14:50 - 15:10	Cvetic J., F. Heidler, A. Nestic, I. Tesnjak: The Generalized TCS Model with the Current Reflections at Ground and at the Upper End of the Lightning Channel
15:10-	Coffee Break	
	Session 7	Lightning Safety (Chair: G. Diendorfer)
15:40- 17:00	15:40 - 16:00	Montag B., H.-D. Betz, W. P. Oettinger, A. Würfl: Lightning-Based Cell-Tracking for Storm-Alert at Airports
	16:00 - 16:20	Łoboda M., K. Sobolewski: Lightning Injuries and Deaths in Poland
	16:20 - 16:40	Kleiter I., R. Lürding, R. Fexer, W. Schulte-Mattler, U. Bogdahn, B. Schalke: Neurological and neuropsychological sequelae in long term lightning survivors
	16:40 - 17:00	Berger G., A.G. Keul: COST P-18 European Lightning Protection Information

19:00 Social event: Visit to a Vienna "Heurigen" Restaurant
 (information, see enclosed sheet)

SYMPOSIUM TIMETABLE
Tuesday May 27, 2009
 Morning Session

Session 8		Lightning to Towers (Chair: Heidler F)
08:30-09:50	08:30 - 08:50	Zhou H., G. Diendorfer, R. Thottappillil, H. Pichler, M. Mair: A Preliminary Analysis of Bipolar Lightning Observed to the Gaisberg Tower from 2000 to 2007
	08:50 - 09:10	Zhou H., N. Theethayi, G. Diendorfer, R.Thottappillil, V.A. Rakov: Effective Height of Towers on Mountain Tops in Lightning Incidence Studies: Sensitivity Analysis
	09:10 - 09:30	Rubinstein A., C. Romero, M. Paolone, M. Rubinstein, F. Rachidi, P. Zweiacker: Instrumentation, Monitoring and Control System for Lightning Measurements on the Säntis Communications Tower
	09:30 - 09:50	Heidler F., M. Manhardt, K. Stimper: Resumption of Lightning Measurements at the TV-Tower "Hoher Peissenberg"
09:50-10:20	Coffee Break	
Session 9		Lightning Location Systems (Chair: M. Rubinstein.)
10:20-12:00	10:20 - 10:40	Djurica V., G. Milev: An Evaluation of LLS Accuracy Improvements Considered by Measurements Collected by RLDN
	10:40 - 11:00	Tuomi T. J.: A Case-Study Update of LF/VHF Relations of Located Lightning
	11:00 - 11:20	Sátori G., P. Bencze, F. Márcz, J. Bór, T. Nagy: Half Century of Lightning Related Observations at Nagycenk, Hungary
	11:20 - 11:40	Mäkelä A., J. Mäkelä, T. Tuomi, N. Porjo, E. Karvinen: Lightning location accuracy in Finland verified by strikes to trees
	11:40 - 12:00	Correia S., V. Prior, J. Batista, A. Silva: Last 6 Years Lightning Network Evaluation
		Closing of the Symposium
12:00-13:30	Lunch Break	

SYMPOSIUM TIMETABLE
Wednesday May 27, 2009
 Afternoon Session

	13:30 - 16:00	Joint WG Meeting – Future of COST P18
		Progress report of WG1 and future plans
		Progress report of WG2 and future plans
		Progress report of WG3 and future plans
		Progress report of WG4 and future plans
		Progress report of WG5 and future plans
		Summary of action plan

16:00	<i>Closing</i>	

Web site

Dedicated Website for the Action is created. This is www.costp18-lightning.org

The website has a public area and a member area. All documents related to the co-operation within this Action will be appearing at the website. The website includes Background information to this COST Action, MC minutes, Publications (Published journal and conference papers, discussion manuscripts), Links to other lightning related websites, Breaking news in lightning research, Activities of the Work Groups etc. Website is being improved and updated on a continuous basis.