The Newsletter on Atmospheric Electricity is sent by e-mail, those colleagues who need a paper version should contact Serge Soula: (serge.soula@aero.obs-mip.fr) or Pierre Laroche: (Pierre.Laroche@onera.fr). They will receive the Newsletter by regular mail. Those who know anybody who needs a printed version are also welcome to contact us. On the other hand, the easiest way to communicate being electronic mail, we would be grateful to all of those who can help us complete the "atmospheric electricity" list of email addresses already available. All issues of this Newsletter are available on the website of the International Commission on Atmospheric Electricity:

http://www.atmospheric-electricity.org/

We remind all our colleagues that the Newsletter remains also available on the website:

http://ae.nsstc.uah.edu/

thanks to Monte Bateman's help.

Contributions to the next issue of this Newsletter (November 2007) will be welcome and should be submitted to the next officers of ICAE before November 15, 2007, preferably under word attached documents. A reminder will be sent to all colleagues whose e-mail addresses are presently listed.

Comment on the photo above: Early stage of a typical thunderstorm on central Tibetan Plateau (31°28'47"N,92°03'39.8"E, 4508m asl.). The mean lifetime is usually about 30 minutes, and flash rate is about 1-2 fl/min.

AWARDS

Dr. Umran Inan of Stanford University has been elected as a Fellow of the American Geophysical Union. The AGU Fellowship is awarded to scientists who have attained acknowledged eminence in one or more branches of geophysics, and the number of Fellows elected each year is limited to no more than 0.1% of the total membership of AGU. Congratulations for this outstanding accomplishment!

REMINDER from the Local Organizing Committee (LOC) of the 13th ICAE

A special issue on Atmospheric Research for ICAE2007 will be published, co-decided by the International Commission on Atmospheric Electricity and the Local Organizing Committee. The Guest Editors are Clive Saunders and Xiushu Qie.

All papers for the special edition should be sent by email to both Clive Saunders (clive.saunders@manchester.ac.uk) and Xiushu Qie (qiex@mail.iap.ac.cn). There are no page charges for Atmospheric Research, but there ARE charges for colored figures.

The deadline for submission of papers will be: **November 2007.** To shorten the publication process, we would like to ask you to prepare as soon as possible your scientific contribution if you wish to submit your paper in this special issue.

ICAE WEBSITE

A new rubric has been created on the website of ICAE: *Next Conferences*
http://www.atmospheric-electricity.org/index.html

It gives a list of Conferences to come and including topics in Atmospheric Electricity. It provides the links towards the websites of the conferences.
You are welcome to provide information to bring this rubric up to date the most regularly possible.

MEETING IN TAHITI

A meeting entitled *Plasma Environmental - Atmospheric electricity - Space charge - Electrical discharges, Applications and prevention - Electrostatics Science and Technology* will be held on 20-23 August 2007 in Tahiti. It is organized by the assembly of the societies of electrostatics in Europe, North America and Japan and the university of French Polynesia. A two-day workshop will be organized the previous week (16-17 August) on the neighbouring island of Moorea on the following topic : creation of better environment using plasma. A description of the objectives of these meeting is available at : gerard.touchard@lea.univ-poitiers.fr

13TH INTERNATIONAL CONFERENCE ON ATMOSPHERIC ELECTRICITY

The Conference will be held on August 13-17, 2007 in Beijing, China

The preliminary program is now available and included below.

For information about this Conference, visit the Web of ICAE2007:
(http://www.casnw.net/icae2007/).

13th International Conference on Atmospheric Electricity

Preliminary Program

August 13-17, 2007
Beijing, China

13th International Conference on Atmospheric Electricity

Organized by:

International Commission on Atmospheric Electricity (ICAE)

Sponsored by:

Chinese Academy of Sciences (CAS)
National Natural Science Foundation of China (NSFC)
Institute of Atmospheric Physics (IAP), CAS
Chinese Academy of Meteorological Sciences (CMAS)
Cold and Arid Regions Environmental and Engineering Research Institute, CAS
University of Science and Technology of China (USTC)
International Assembly of Meteorology and Atmospheric Science (IAMAS)
Electricite Atmospherique 2003
Chinese Meteorological Society (CMS)
Lightning Protection Center of Guangdong Province (LPCGP)
Shanghai Lightning Protection Center (SLPC)
Lightning Protection Center of Chongqing City (LPCCC)
Lightning Protection Center of Shandong Province (LPCSP)
Lightning Protection Center of Shanxi Province (LPCSP)
Nanjing University of Information Science & Technology (NUIST)
Chengdu University of Information Technology (CUIT)
Zhongguang Hi-tech Industry Development Group (ZHIDG)
Society for Atmospheric Electricity of Japan (SAEJ)

International Commission:

Chairman: P. Laroche *(France)*

Secretary: S. Soula *(France)*

Member: S. Anisimov *(Russia)*, H. Christian *(USA)*, J. E. Dye *(USA)*, C. Guo *(China)*, M. Ishii *(Japan)*, S. Israelson *(Sweden)*, Z. Kawasaki *(Japan)*, P. Krebhiel *(USA)*, P. Laroche *(France)*, S. Michnowski *(Poland)*, M. Nakano *(Japan)*, O. Pinto *(Brazil)*, X. Qie *(China)*, V. Rakov *(USA)*, D. Rust *(USA)*, C. Saunders *(UK)*, S. Soula *(France)*, E. Williams *(USA)*

Local Organizing Committee:

Honorary Chairman: Xiuji Zhou and Daren Lu

Chairperson: Xiushu Qie

Member: Jianchun Bian, Hongbin Chen, Guili Feng, Changming Guo, Xiangzhen Kong, Liangfu Li, Jinli Liu , Xinsheng Liu, Hui Luo, Yunfeng Luo, Jietai Mao, Xiaobo Ren, Shanchang Tao, Chunyi Wang, Deyan Wang, Jianchu Wang, Zhenhui Wang, Shaojie Yang, Guangshu Zhang, Lu Zhang, Qilin Zhang, Tong Zhang, Yijun Zhang, Yunjun Zhou, Baoyou Zhu, Yang Zhao

Secretariat: Yang Zhao, Ying Chen, Guangyang Fang, Lunxiang Pan

13th International Conference on Atmospheric Electricity

Topics

S1. Global circuit

S2. Ion and fair weather electricity

S3. Thunderstorm electrification

S4. Lightning physics

S5. Lightning and meteorology - operational application and basic research

S6. Lightning and climate

S7. Electrical effects of thunderstorms on the middle and upper atmosphere

S8. Lightning detection

S9. Lightning Effect and its Protection

Time Table

	Sun., 12 Aug	Mon., 13 Aug	Tues., 14 Aug	Wed., 15 Aug	Thur., 16 Aug	Fri., 17 Aug
08:15			Oral Presentation S3	Oral Presentation S4	Oral Presentation S5	Oral Presentation S7
08:30						
09:00	Arrival & Registration	Opening Ceremony				
09:30						
09:45						Coffee Break
10:00		Coffee Break	Coffee Break	Coffee Break	Coffee Break	
10:15						Oral Presentation S8
10:30		Oral Presentation S1	Oral Presentation S3	Oral Presentation S4	Oral Presentation S6	
11:00						
11:30						Oral Presentation S9
11:45						
12:00		Lunch	Lunch	Lunch	Lunch	Lunch
12:15						
12:30						
13:00						
13:30		Oral Presentation S2	Posters S3 & S8	Posters S4	Posters S5 & S6	Posters S7 & S9
14:00						
14:30		Coffee Break				
15:00						
15:30		Posters S1 & S2	Coffee Break	Coffee Break	Coffee Break	Coffee Break
15:45						
16:15			Posters S3 & S8	Posters S4	Posters S5 & S6	Closing Ceremony
16:45						
17:00						
17:30						
18:00						
19:00	Welcome Reception		Conference Banquet			
19:30						
20:00						
20:30						
20:45						
21:00						
21:15						
21:30						

Preliminary Program

Monday, 13 August	Friendship Palace, Friendship Hotel
9:00-10:00	Opening Ceremony

Oral Session

Session 1: Global circuit

Monday, 13 August **10:30 -12:15** **(15 minutes for each talk)**

Chairpersons: **Robert H. Holzworth**
Colin Price

S1-0 *10:30-11:00*
Overview: The Global Electrical Circuit: A Review
By: Earle Williams (30 minutes)

S1-1 *11:00-11:15*
Electric Fields and Conductivity Measured in the Stratosphere above Thunderstorms: Implications for the Global Electrical Circuit
Jeremy N. Thomas, Robert H. Holzworth and Michael P. McCarthy

S1-2 *11:15-11:30*
The polar ground level atmospheric electric field and current variations in relation to solar wind changes
S.Michnowski and M.Kubicki, N.Kleimenova, N.Nikiforova, O.Kozyreva, S.Israelsson

S1-3 *11:30-11:45*
The Stratiform Precipitation Region of Mesoscale Convective Systems: Implications for Inductive Charging Mechanisms and Global Circuit Modeling
M. Stolzenburg, T. C. Marshall, W. D. Rust, E. A. Mareev, and S. S. Davydenko

S1-4 *11:45-12:00*
C.T.R. Wilson versus G.C. Simpson: Fifty Years of Controversy in Atmospheric Electricity
Earle Williams

S1-5 *12:00-12:15*
Diurnal Lightning Distributions as Observed by the Optical Transient Detector (OTD) and the Lightning Imaging Sensor (LIS)
Jeff C. Bailey, Richard J. Blakeslee, Dennis E. Buechler and Hugh J. Christian

LUNCH (12:15-13:30)

Session 2: Ion and fair weather electricity

Monday, 13August **13:30-15:00** **(15 minutes for each talk)**

Chairpersons: **Lothar H. Ruhnke**
Kenkichi Nagato

S2-0 **Overview:** Air ion research 2003-2006
13:30-14:00 *By: Hannes Tammet* (30 minutes)

S2-1 Long-term measurements of the vertical electrical potential gradient in the atmospheric
14:00-14:15 surface layers
Sven Israelsson

S2-2 Laboratory study on nano-particle formation by ionization in air
14:15-14:30 *Kenkichi Nagato*

S2-3 Apposite of atmospheric electric parameters with the energy coupling function (ε) during
14:30-14:45 geomagnetic storms at high latitude
C.P. Anilkumar, C. Panneerselvam, K.U.Nair, R.Ramar, K.Jeeva and S.Gurubaran

S2-4 Transport of aeroelectricity in the lower atmosphere
14:45-15:00 *S.V. Anisimov N.M. Shikhova, R.D. Kouznetsov*

COFFEE BREAK (15:00-15:30)

Session 3: Thunderstorm electrification

Tuesday, 14 August **08:15-12:30**

Chairpersons : Conrad Ziegler
Yunjun Zhou **08:15-10:00 (15 minutes for each talk)**

S3-0 **Overview:**
08:15-08:30 *By: Paul R. Krehbiel* (30 minutes)

S3-1 A review on the electrical characteristics of thunderstorm in the Chinese Inland Plateau
08:45-09:00 and Tibetan Plateau
Xiushu Qie, Tingling Zhang, Yijun Zhang, Xinsheng Liu

S3-2 Initial electrification of thunderstorms evidence for a connection between precipitation
09:00-09:15 and charging
M. Stolzenburg, T. C. Marshall, P. R. Krehbiel, W. Rison, R. J. Thomas, T. Hamlin, G. Aulich, S. Hunyady, W. P. Winn

S3-3 Thunderstorm Electrification: Asymmetric Charging, Ice Crystal/Graupel Charging and
09:15-09:30 Anomalous Zones
Clive Saunders and Christopher Emersic

S3-4 Electric field, particles and reflectivity in Florida anvils
09:30-09:45 *J.E. Dye, J.C Willett, M.G. Bateman, H.J. Christian, E. Defer, C.A. Grainger, W.D. Hall, E.P. Krider, S.A. Lewis, D.M. Mach, F.J. Merceret, P.T. Willis*

S3-5 Electrical evolution during the decay stage of New Mexico thunderstorms
09:45-10:00 *T. C. Marshall, M. Stolzenburg, P. R. Krehbiel, W. Rison, R. J. Thomas, T. Hamlin, G. Aulich, S. Hunyady, N. Ramig, W. P. Winn*

COFFEE BREAK (10:00-10:30)

Chairperson: **Kyle C. Wiens, Tsutomu Takahashi** **10:30-12:30 (15 minutes for each talk)**

S3-01 **Overview:** What's New from Model and Laboratory Results in Storm Electricity
10:30-11:00 *By: Edward Mansell* (30 minutes)

S3-6 Field identification of a unique globally dominant mechanism of thunderstorm electrification
11:00-11:15 *J. Latham, W. A. Petersen, W. Deierling and H. J. Christian*

S3-7 The Charge Structure of a Typical Thunderstorm in Chinese Inland Plateau
11:15-11:30 *Tinglong Zhang, Xiushu Qie, Tie Yuan, Guangshu Zhang, Tong Zhang, Yang Zhao*

S3-8 Long continuing luminosity of cloud-to-ground flashes observations at urban area, Brazil
11:30-11:45 *Rosangela Barreto Biasi Gin, Augusto José Pereira, Cesar Beneti*

S3-9 The charge transfer and electric field changes during the cloud-to-ground lightning flash in thundercloud
11:45-12:00 *Shanchang Tao, Yongbo Tan, Baoyou Zhou, Ming Ma, Weitao Lu*

S3-10 Impact of varying inversion strength on the electrification, lightning, kinematics, and microphysics in a simulated supercell storm
12:00-12:15 *Conrad L. Ziegler, Edward R. Mansell, Jerry M. Straka, Donald R. MacGorman and Donald W.Burgess*

S3-11 Temporal and spatial structure of storm charge and kinematics in the 26 May 2004 supercell storm during TELEX
12:15-12:30 *Eric C. Bruning., W.David Rust, Donald R. MacGorman, Terry J. Schuur, Paul R.Krehbiel, William Rison*

LUNCH (12:30-13:30)

Session 4: Lightning physics

Wednesday, 15 August **08:15-12:30**

Chairpersons: **K. L. Cummins Baoyou Zhu** **08:15-10:00 (15 minutes for each talk)**

S4-0 **Overview:** Recent Progress and Open Questions on the Physics of Lightning

08:15-08:45 *By: Pierre Laroche* (30 minutes)

S4-1 Characteristics of artificially triggered lightning during SHATLE

08:45-09:00 *Yang Zhao, Xiushu Qie, Qilin Zhang, Jing Yang, Yunjun Zhou, Xiangzhen Kong, Tinglong Zhang, Guili Feng, ShujunWu*

S4-2 OTD Observations of Continental US Ground and Cloud Flashes

09:00-09:15 *William Koshak*

S4-3 Do Extensive Air Showers of Cosmic-Ray Secondaries Initiate Lightning, and If

09:15-09:30 So, How Would We Know?

William H. Beasley, Kenneth B. Eack, Robert Roussel-Dupre

S4-4 On the NOx generation in "cold" electrical discharges

09:30-09:45 *Vernon Cooray, Marley Becerra and Mahbubur Rahman*

S4-5 Recoil Streamer Inception During Lightning Development

09:45-10:00 *L'Helgoualc'h, P. Lalande, A. Broc, P. Laroche*

COFFEE BREAK (10:00-10:30)

Chairpersons: Vladimir A. Rakov
Vernon Cooray

10:30-12:30 (15 minutes for each talk)

S4-6 Measurements of Lightning Parameters Using Correlated Video and NLDN Data

10:30-10:45 *E. P. Krider, C. J. Biagi, K. L. Cummins, S. Fleenor, and K. E. Kehoe*

S4-7 Measurement of cloud-to-ground and spider leader speeds with high-speed video

10:45-11:00 observations

Marcelo M. F. Saba, Leandro Z. S. Campos, Maurício G. Ballarotti, Osmar Pinto Jr.

S4-8 Luminosity characteristics of a Natural Cloud-to-ground Lightning

11:00-11:15 *Yijun Zhang, Jun Li, Weitao Lu, Wansheng Dong, Shaodong Chen*

S4-9 3D simulation of lightning stroke

11:15-11:30 *Laurent Chemartin, Philippe Lalande, Emmanuel Montreuil, Clarisse Delalondre, Bruno Chéron, Christophe André*

S4-10 Laboratory research on lightning control by femtosecond laser plasma channel

11:30-11:45 *Lu Xin, Zhang Jie, Zhang Zhe, Hao Zuo-Qiang, Zhang Shi-Chang, Zhang Dong-Dong, Wang Zhao-Hua, Ma Yuan-Yuan, Yan Ping*

S4-11 High current upward lightning flashes in winter

11:45-12:00 *Ishii M., M. Saito, N. Itamoto, A. Sugita*

S4-12 Multifractal Analysis of Lightning Radiation Pulse Event Sequences

12:00-12:15 *Xueqiang Gou, Yijun Zhang, Wansheng Dong , Qilin Zhang*

S4-13 Radiation Bursts Synchronizing with Lightning Discharges in Hokuriku, Japan

11:15-12:30 *S. Yoshida, M. Satoh, T. Morimoto, T. Ushio, Z. Kawasaki, T. Torii, D. Wang, N. Takagi, and T. Watanabe*

LUNCH (12:30-13:30)

Session 5: Lightning and meteorology ---- operational application and basic research

Thursday, 16 August **08:15-10:00 (15 minutes for each talk)**

Chairpersons: John Latham
Yijun Zhang

S5-0 **Overview:** Emerging Trends and Opportunities for the Operational Application of
08:15-08:45 Lightning Data
By: Steve Goodman (30 minutes)

S5-1 TRMM-PR and LIS observations of lighting activity over Japan
08:45-09:00 *Redy Mardiana, Zen-Ichiro Kawasaki*

S5-2 Studying intense tropical cyclones using the World Wide Lightning Detection Network
09:00-09:15 *Natalia N. Solorzano, Jeremy N. Thomas and Robert H. Holzworth*

S5-3 Lightning activity and precipitation structure of hailstorms
09:15-09:30 *FENG Guili, QIE Xiushu, YUAN Tie & NIU Shuzhen*

S5-4 Study of the total lightning activity in a hailstorm
09:30-09:45 *Joan Montanyà, Serge Soula, Nicolau Pineda, Oscar van der Velde, Pere Calpers, Gòria Solà, Joan Bech, D.Romero*

S5-5 Lightning and electrical structure of a heavy-precipitation supercell storm during TELEX
09:45-10:00 *Donald R. MacGorman, Kristin M. Kuhlman, W. David Rust, Michael I. Biggerstaff, Terry J. Schuur, Jerry M. Straka, Paul R. Krehbiel, William Rison, and Larry D. Carey*

COFFEE BREAK (10:00-10:30)

Session 6: Lightning and climate

Tuesday, 16 August **10:30-12:30 (15 minutes for each talk)**

Chairpersons: Osmar Pinto Jr.
Zhenhui Wang

S6-0 **Overview:** Lightning and climate: A review
10:30-11:00 *By: Colin Price* (30 minutes)

S6-1 Lightning as an Indicator of Liquid and Ice Precipitation Processes in the Tropical
11:00-11:15 Atmosphere
Walter A. Petersen and Hugh J. Christian

S6-2 Study on Lightning Activities and Precipitation Characteristics before and after South
11:15-11:30 China Sea Summer Monsoon Onset
Tie Yuan, Xiushu Qie

S6-3 Global Impact of ENSO events by TRMM observations
11:30-11:45 *S. Yoshida, N. Nakazato, S. Oita, T. Morimoto, T. Ushio, and Z. Kawasaki*

S6-4 Anomalous lightning activity over Metropolitan Region of São Paulo due to urban

11:45-12:00 effects

W. R. G. Farias, O. Pinto Jr., K.P. Naccarato e I.R.C.A. Pinto

S6-5 Lightning season on earth

12:00-12:15 *I.R.C.A. Pinto, O. Pinto Jr., and K.P. Naccarato*

S6-6 Temporal and regional variation of lightning occurrences and their relation to climate

12:15-12:30 variability

M. Sato, Y. Takahashi, A. Yoshida, Y. Okazaki, T. Adachi, and H. Fukunishi

LUNCH (12:30-13:30)

Session 7: Electrical effects of thunderstorms on the middle and upper atmosphere

Friday, 17 August **08:15-09:45** **(15 minutes for each talk)**

Chairpersons: Yoav Yair
Serge Soula

S7-1 Global Occurrence of TLEs and Their Effects

08:15-08:30 *Han-Tzong Su, Alfred B. Chen, Cheng-Ling Kuo, Yi-Jen Lee, Rue-Ron Hsu, Jyh-Long Chern, Harold U. Frey, Stephen B. Mende, Yukihiro Takahashi, Hiroshi Fukunishi, and Lou-Chuang Lee*

S7-2 Winter thunderstorms in the eastern mediterranean and associated transient luminous

08:30-08:45 events

Yoav Yair, Colin Price, Michal Ganot, Baruch Ziv, Yosef Sherz, Eran Greenberg, Adam Devir, Roy Yaniv, József Bór and Gabriella Sátori

S7-3 Global modeling of accumulated electron density enhancements over thunderstorms from

08:45-09:00 successive strong lightning strokes

Erin H. Lay, Robert H. Holzworth, Mengu Cho, and Jeremy N. Thomas

S7-4 Observation of daytime perturbations of VLF transmitter signals

09:00-09:15 *Benjamin R. T. Cotts, Umran S. Inan,*

S7-5 Analysis of thunderstorm systems and lightning activity associated with sprites observed

09:15-09:30 during the Eurosprite campaigns 1- Statistical studies

Oscar van der Velde, Serge Soula, Torsten Neubert

S7-6 Sprite model experiments and observations of winter sprites

09:30-09:45 *Yukihiro Goto, Yasuhiro Ohba, Ken'ichi Narita*

COFFEE BREAK (09:45-10:15)

Session 8: Lightning detection

Friday, 17 August **10:15-11:45** **(15 minutes for each talk)**

Chairpersons: Zen Kawasaki
Jianchu Wang

S8-0 **Overview:** (30 minutes)
10:15-10:45 *By: Hugh Christian*

S8-1 Applications of a Portable Lightning Mapping Array
10:45-11:00 *William Rison, Paul Krehbiel, Ron Thomas, Harald Edens, Graydon Aulich, Mike Stock and Nicolas O'Connor*

S8-2 Assessment of thunderstorm lifecycle using total lightning systems
11:00-11:15 *Jean-Yves Lojou, Martin J. Murphy, Nicholas W. S. Demetriades, Kenneth L. Cummins*

S8-3 A new-developed narrowband radio interferometer system and its preliminary
11:15-11:30 observation result on lightning discharge
Yuxiang Zhao, Guangshu. Zhang, Qilin Zhang, Tong Zhang, Xiushu Qie, Chengpin. Chen

S8-4 Three-dimensional VHF observations using advanced VHF broadband digital
11:30-11:45 interferometer
Manabu AKITA, Kenji HIRAI, Masahito SATOH, Yoshitaka NAKAMURA
Takeshi MORIMOTO, Tomoo USHIO, and Zen KAWASAKI

Session 9: Lightning Effect and its Protection

Friday, 17 August **11:45-12:30** **(15 minutes for each talk)**

Chairpersons: E.M. Bazelyan
Shaojie Yang

S9-1 Investigation of upward leaders and other induced lightning effects on tall structures
11:45-12:00 *Lothar H. Ruhnke, Vladislav Mazur, Renato de Oliveira, Marcelo Felipe, Silvério Visacro*
S9-2 Lightning-induced Magnetic Fields in Buildings with Metallic Plates
12:00-12:15 *Y. Du, Qi-bin Zhou and M.L. Ming-li Chen*
S9-3 The research on current diffusing mechanism of lightning struck buildings'plastic-steel
12:15-12:30 windows and doors
Li Liangfu, Li Jiaqi, Qin Binquan

LUNCH (12:30-13:30)

Poster Session

Session 1: Global circuit
Session 2: Ion and fair weather electricity

Monday, 13 August **15:30-18:00**

Chairperson: S. V. Anisimov

Brian Tinsley

S1-6 An improved lorentzian technique for exploring the earth-ionosphere resonator
Vadim Mushtak, Earle Williams

S1-7 Electric air-earth vertical current pulsations at Hornsund during polar substorms: Case study
O.V. Kozyreva, N.N. Nikoforova, N.G. Kleimenova, S. Michnowski, M. Kubicki

S1-8 Lifetime of the electric energy in the global atmospheric circuit
E. A. Mareev, S.V. Anisimov

S1-9 On atmospheric electric field anomaly before the Carpathian earthquake of 30.08.1986 at the Polish observatory Swider
N.N. Nikiforova, K.P. Teisseyre, S. Michnowski, M. Kubicki

S1-10 On reconstructing global lightning scenarios from background schumann resonance observations
Vadim Mushtak, Earle Williams

S1-11 On the relation between electric field changes and thunderstorm currents
Yu.V.Shlugaev, V.V.Klimenko, E. A.Mareev, D.I.Iudin, A.V.Biryukov, V.P.Denisov

S1-12 The production of space charge in layer clouds
Limin Zhou, Brian A. Tinsley Xiangmin Zheng, Shijie Wang, Ouyang Ziyuan

S1-13 Seasonal and daily variations of atmospheric electricity parameters registered at the geophysical observatory at Świder (Poland) during 1965-2000
M. Kubicki, S. Michnowski, B. Mysłek-Laurikainen

S1-14 Modeling the Electric Structure of Small Thunderstorms and Their Contribution to the Global Electric Circuit
Stanislav S. Davydenko, Thomas C. Marshall , Maribeth Stolzenburg

S1-15 The influence of thunderstorm's lightnings the global electrical circuit
V.Morozov

S1-16 The role of the global electric circuit in solar and internal forcing of clouds and climate
Brian A. Tinsley, G. B. Burns, and Limin Zhou

S1-17 The thunderstorm system as AC circuit
Andrei E. Sorokin

S1-18 Transient currents in the global electric circuit due to CG and IC lightning

C. R. Maggio, T. C. Marshall, M. Stolzenburg, B. Ray, E. A. Mareev, S. S. Davydenko, S. Yashunin, P. R. Krehbiel, W. Rison, R. J. Thomas, T. Hamlin

S1-19 Atmospheric Electric Circuit Influences on Ground Level Pressure at High Magnetic Latitudes in the Southern and Northern Hemispheres
G.B. Burns and B.A. Tinsley

S1-20 Calculating global storm activity rate on the basis of Schumann resonance background component
Zenon Nieckarz, Andrzej Kułak, Marek Kubicki, Stanisław Michnowski and Piotr Barański

S1-21 Modeling the Quasi-Static Electric Structure of Various Scales of Thunderstorms
Stanislav S. Davydenko, Alexander S. Sergeev, Eugene A. Mareev , Thomas C. Marshall , Maribeth Stolzenburg

S1-22 Modeling transient currents above the thunderstorm clouds
S.A. Yashunin, E. A. Mareev, S.S. Davydenko, T.C. Marshall, M. Stolzenburg, C.R. Maggio

S1-23 Remote sensing of electric field and current at spaced stations
S.V. Anisimov, E. A. Mareev, N. M. Shikhova, V.V.Klimenko, K.V. Aphinogenov, U.V. Shlugaev, S.S. Bakastov, E.M. Dmitriev, A.V.Biryukov, V.P. Denisov

S1-24 A study of seasonal variation of point discharge current during thunderstorms at Pune
G.K. Manohar and S.S. Kandalgaonkar , M.I.R. Tinmaker and M.K. Kulkarni

S2-5 A joint dataset of fair-weather atmospheric electricity
Hannes Tammet

S2-6 Alpine atmospheric electricity monitoring on the peak TERSKOL in 2004-2005
G. Kupovykh, A. Boldyreff

S2-7 Changeability of the atmospheric electric field vertical distribution in the lower troposphere and its connection with the aerosol pollution
Avtandil Amiranashvili, Vazha Amiranashvili, Albert Nodia

S2-8 Classification of intermediate air ion formation events at Tahkuse observatory, Estonia
Kaupo Komsaare, Urmas Hõrrak, Hannes Tammet, Devendraa Siingh, Marko Vana, Anne Hirsikko and Markku Kulmala

S2-9 Experimental studies on temporal, vertical and spatial variations of atmospheric electrical conductivity related to radioactivity at Mysore
Chandrashekara M S, N Ragini, T S Shashikumar and L Paramesh

S2-10 Large scale monitoring of troposphere electric field
Jerzy Berlinski, Grzegorz Pankanin, Marek Kubicki

S2-11 Lisbon fair weather atmospheric electric field and influences of the local meteorology
Cláudia Serrano, A. Heitor Reis

S2-12 Profiles of polar conductivities and radon-222 concentration in the atmosphere by stable and labile stratification of surface layer
A.I.petrov, G.G.Petrova, I.N.Panchishkina

S2-13 Relations of aeroelectric and temperature fields in the lower atmosphere
S.V. Anisimov, E. A. Mareev, N. M. Shikhova

S2-14 Scavenging of atmospheric ions and aerosols by the drifting snow at Antarctica

A K Kamra, Devendraa Siingh and Vimlesh Pant

S2-15 Small ions concentration in the air above athens, GREECE
A. Retalis, P. Nastos and D. Retalis

S2-16 Some air electricity phenomena caused by waterfalls
Tiia-Ene Parts, Aare Luts, Lauri Laakso, Anne Hirsikko, Tiia Grönholm, Markku Kulmala

S2-17 Studies about atmospheric electricity the dependence between air ionization level and altitude in different locations
Florian Mandija , Floran Vila

S2-18 Surface layer electric state time-depended modeling
V. Morozov, G.Kupovykh, A. Klovo

S2-19 Surface observations of atmospheric electrical parameters at the low latitude site, TIRUNELVELI (8.7^{o}N, 77.8^{o}E)
R. Ramar, C. Panneerselvam, K. Jeeva, K. U. Nair, C. Selvaraj, C. P. Anil Kumar and S. Gurubaran

S2-20 Tropo-strato-mesospheric electrical conductivity from an aerosol-ion-chemical model
K Nagaraja, B S N Prasad and N Srinivas

S2-21 Space charge generation in the atmosphere and the density of mechanical transfer current to the ground
I.N. Panchishkina, G.G. Petrova, A.I.Petrov T.V. Kudrinskaya

S2-22 The computer modeling of the atmosphere electrode effect dynamics
Eldar M. Dmitriev

S2-23 Recovery of space charge distribution by the method of test structures
M.V. Shatalina, E. A. Mareev, S.V. Anisimov, N. M. Shikhova

S2-24 Statistical Structure of Air Electric Conductivity in Dusheti
Avtandil Amiranashvili , Vazha Amiranashvili , Alexi Khunjua , Albert Nodia

S2-25 The analysis of AC corona in atmospheric air
C.H. Zhang, Z.H. Zhao and J.M.K. MacAlpine

Session 3: Thunderstorm electrification
Session 8: Lightning detection

Tuesday, 14 August **14:00-18:00**

Chairperson: Daohong Wang

Hui Luo

S3-12 A modeling study of the impact of ice particle sizes and relative velocity on non-inductive charge transfer
B. Tsenova, R. Mitzeva, C. Saunders

S3-13 Analysis of the altitude of the isotherms and the electrical charge for flashes that struck the Gaisberg tower
Joan Montanyà, Serge soula, Gerhard Diendorfer, G. Solà1, D. Romero

S3-14 Characteristics of Discharges Occurred in a Simulated Cloud

A. Hazmi, N. Kamegai, D. Wang, N. Takagi, T. Watanabe

S3-15 Comparison of modeled and observed electrical charging and lightning in a low-precipitation supercell storm during TELEX

Jerry M. Straka, Edward Mansell,Don Macgorman,, Eric Bruning, and Conrad Ziegler

S3-16 Connection of Thunderstorm Processes Intensity with Aerosol Pollution of the Atmosphere

Avtandil Amiranashvili, Vazha Amiranashvili, Darejan Kirkitadze, Albert Nodia

S3-22 Electric charge evolution in east Asian monsoon storm systems

Tsutomu Takahashi

S3-18 Electric field profiles over hurricanes, tropical cyclones, and thunderstorms with an instrumented ER-2 aircraft

Douglas M. Mach, Richard J. Blakeslee, Monte G. Bateman, Jeffery C. Bailey

S3-19 Electrical characteristics of an isolated Tibetan thunderstorm

D. Wang, K.Minamitani, N.Takagi, T.Watanabe, Y. Tie and X.Qie, Y. Zhang

S3-20 Extensive lower positive charge centers and their role in lightning in thunderstorms in tropical regions

A K Kamra and S D Pawar

S3-21 Impact of aerosols in cloud electrification: Results from cloud modeling and measurements at the Amazon region

Rachel Albrecht, Carlos Morales, and Maria A. Silva Dias

S3-17 Narrow bipolar events and their associated VHF emissions 1. Observations at the flash level

T. Hamlin, K. C. Wiens, D. R. MacGorman, N. Ramig, W. Rison, P. R. Krehbiel

S3-23 Inverted polarity storms: Implications for storm electrification processes

Paul Krehbiel

S3-24 Lightning and Radar Observations of Thunderstorm Electrification

Paul Krehbiel

S3-25 On the generation and stability of charge layers in MCS stratiform regions

A.A. Evtushenko, E. A. Mareev, T.C. Marshall, M. Stolzenburg

S3-26 Simulated electrification of a TELEX multicell storm

Edward R. Mansell, Conrad L. Ziegler and Eric C. Bruning

S3-27 Numerical simulation of the relationship between electrification and microphysics in hailstorms

Tuanjie Hou, Shengjie Niu, Hengchi Lei

S3-28 The Electrification of Dust-Lofting Gust Fronts (‘Haboobs’) in the Sahel

E. Williams, N. Nathou, E. Hicks, C. Pontikis, B. Russell, M. Miller, M. J. Bartholomew

S3-29 The study of charge structure sensitivity in simulated thunderstorms

Rumjana Mitzeva, Boryana Tsenova, Rachel Albrecht and Walt Petersen

S3-30 To the 2D Electric Structure of the Fog

Andrei E. Sorokin

S3-31 Electrical Self-Polarization In Intracloud Lightning Flashes

Nelson Falcón, Amilkar Quintero and Leopoldo Ramirez

S3-32 The Methane Influence As A Self-Polarizated Aerosol In Titan’S Electrical Activity

Amilkar Quintero, Nelson Falcón and Leopoldo Ramirez

S8-5 The Lighting Flash

H. J. Christian, J. Latham and M. G. Bateman

S8-6 A compact, integrated lightning detector for making optical and electromagnetic measurements of lightning

Mingli CHEN ,Huaibin WANG , Yaping DU

S8-7 Calibration and validation of vaisala's long range lightning detection network (LLDN)

Kenneth L. Cummins, Martin J. Murphy

S8-8 Cloud lightning from the U.S. National Lightning Detection Network (NLDN)

Martin J. Murphy, Nicholas W. S. Demetriades, Kenneth L. Cummins and Ronald L. Holle

S8-9 Detection of low-amplitude lightning with LINET in Europe

K. Schmidt, H. D. Betz, B. Fuchs, V. Meyer, P. Laroche, P. Blanchet , W. P. Oettinger , E. Defer

S8-10 Improvements to the detection efficiency model for the Brazilian lightning detection network

Kleber. P. Naccarato, Osmar Pinto Jr., Guilherme Damata

S8-11 Lightning detection in Venus by Venus Climate Orbiter, PLANET-C

Yukihiro Takahashi, Jun Yoshida, Shinya Ueda, Tomoo Ushio, Masaki Tsutsumi, Yoav Yair, and Marina Galand

S8-12 Lightning Geo-location via Combined use of Time of Arrival, Arrival Azimuth, and VLF Propagation Measurements of Radio Atmospherics

Ryan Said, Umran Inan

S8-13 Lightning observations with the universal software radio peripheral

Mark Stanley

S8-14 LINET–A new lightning detection network in Europe

Hans D. Betz, Kersten Schmidt, Pierre Laroche, Patrice Blanchet, Wolf P. Oettinger, Eric Defer

S8-15 The preliminary errors analysis of 3 Dimensional lightning of VHF radiation locating system

D.Cao, G. Zhang, T. Zhang, Q. Zhang, T. Yuan, Y. Wang, Y. Zhao, Y.Li

S8-16 Spaceborne VHF broadband digital interferometer for thunderstorm observations

Takeshi MORIMOTO, Zen KAWASAKI and Tomoo USHIO

S8-17 Research of Data Comparison from Multiple Lighting Detecting Systems

Jia Jia, Cai Zhenxin

S8-18 Design of A Three dimensional Wideband Sensor for LEMP Electric Field Measurements

Xu Yuanzhe, Gao Cheng, Shi Lihua, Li Yanxin, Zhou Bihua

S8-19 A 3-D Location System of Lightning VHF Radiation and Preliminary Observation Results

Yanhui Wang ,Guangshu Zhang, Tong Zhang, Xiushu Qie, Dongjie Cao, Yuxiang Zhao

S8-20 Development and Applications of a New, Low-Power, Low-Maintenance Electric-Field Meter for Research and Hazard-Warning Decision Support

William H. Beasley, Leon G. Byerley, Jody A. Swenson, Alan L. Hinckley, and Ivan G. Bogoev

S8-21 Improving the location and characterization of the VLFLF emissions from lightning, as detected by the Los Alamos Sferic Array, by utilizing a physics based propagation model

Harlin, J D Shao, X Colestock, P Hamlin, T Wiens, K

S8-22 Satellite based observations of LIS and OTD: A comparative study of flash count during the overlapping period
M.K. Kulkarni, M.I.R. Tinmaker and S.S. Kandalgaonkar

Session 4: Lightning physics

Wednesday, 15 August **14:00-18:00**

Chairperson: Masaru Ishii

R. J. Thomas

S4-14 Initial Breakdown Inside of Thunderstorms
P. M. Bitzer, H. J. Christian and J. Latham

S4-15 3-D FEM Modeling of Lightning Modes in Thunderstorms
William Rison, Paul Krehbiel, Ron Thomas, and Mike Stock

S4-16 About the variation in the cloud-to-ground lightning return stroke peak current in different regions on earth
O. Pinto Jr. and I.R.C.A. Pinto

S4-17 Analysis of Microsecond- and Submicrosecond-Scale Electric Field Pulses Produced by Cloud and Ground Lightning Discharges
Amitabh Nag, Brian A. DeCarlo, and Vladimir A. Rakov

S4-18 Analysis of Optical Characteristics of Physical Processes in Rocket-triggered Lightning
Weitao Lu, Yijun Zhang, Xiuji Zhou, Qing Meng, Dong Zheng, Ming Ma, Fei Wang Shaodong Chen, Xiushu Qie

S4-19 Broadband electric field measurements and mapping of lightning flashes over Langmuir Laboratory
Harald E. Edens, Paul R. Krehbiel, William Rison, Nicholas O'Connor, Matthew Briggs,Steven J. Hunyady, Michael Stock, Ronald J. Thomas, William P. Winn, Graydon Aulich

S4-20 Calculations of electromagnetic fields from incloud discharges at close range
Baoyou Zhu , Helin Zhou, Shanchang Tao

S4-21 Characteristics and Numerical Simulation of Lightning Current Waveforms along with the channel
Qilin Zhang, Xiushu Qie, Yang Zhao, Xiangzhen Kong, Jing Yang

S4-22 Characteristics of a positive cloud-to-ground lightning flash observed by high speed video camera
Xiangzhen Kong, Xiushu Qie, Yang Zhao

S4-23 Charge density distribution along a positive upward lightning leader stroke channel
A.Hazmi, K.Hara, D.Wang. N.Takagi, T.Watanabe, H.Sakurano, M.Hashimoto

S4-24 Cloud-to-ground continuing current properties from high-speed video observations
Marcelo M. F. Saba, Maurício G. Ballarotti, Osmar Pinto Jr.

S4-25 Comparative analysis of the initial stage in two classical artificially-triggered lightning flashes

Jing Yang, Xiushu Qie, Qilin Zhang, Yang Zhao Guili Feng, Tinglong Zhang, Xiangzhen Kong, Guangshu Zhang

S4-26 Continuing current in multiple channel cloud-to-ground lightning
Marco Antonio da Silva Ferro, Marcelo Magalhães Fares Saba, Osmar Pinto Jr.

S4-27 Deterministic chaos in electromagnetic field induced by lightning discharge
Tadaomi Miyazaki, Tomio Okada

S4-28 Effect of the space charge layer created by corona at ground level on the inception of upward lightning leaders from tall towers
M. Becerra, V. Cooray, S. Soula and S. Chauzy

S4-29 Electric field characteristics of leader and return stroke at 60m and 550m in triggered lightning
Qilin Zhang, Xiushu Qie, Yang Zhao, Xiangzhen Kong, Jing Yang

S4-30 Error Analysis on the Calculated Radiation Field Peaks of Return Strokes due to the Assumption of Straight and Vertical Channels
Zhongkuo Zhao, Qilin Zhang, Xiushu Qie

S4-31 First high-speed camera observations of lightning in south Brazil
Maurício G. Ballarotti, Marcelo M. F. Saba, Osmar Pinto Jr., Vandoir Bourscheidt, Kleber P. Naccarato

S4-32 Investigation of influence of the group of model hydrometeors on the main stage characteristics of a discharge between an artificially charged water aerosol cloud and a grounded electrode
Temnikov A.G., Orlov A.V., Chernensky L.L., Pisarev V.P.

S4-33 “Leader-return stroke model” and calculation of artificial triggered lightning stroke’s characteristics
Dong Zheng , Yijun Zhang , Weitao Lü, Qing Meng , Xiushu Qie

S4-34 Lighting Electromagnetic Radiation Field Spectra in the Interval from 25-300 MHZ
Dong Wansheng

S4-35 Lightning discharges producing pulse trains indicative of preliminary breakdown in cloud-to-ground lightning but not followed by return strokes
Amitabh Nag, Vladimir A. Rakov

S4-36 Misconceptions and reasonable assumptions for modeling leader and return stroke processes
Lothar H. Ruhnke

S4-37 Analysis on the initial stage of intracloud lightning in the Chinese Inland Plateau
Dongfang Wang, Tie Yuan, Guangshu Zhang, Tong Zhang, Tinglong Zhang

S4-38 Numerical modeling of the lightning return stroke
J.-F. Ripoll, P. L. Colestock, J. Zinn, C. Jeffery, X.-M. Shao

S4-39 Observations of preliminary breakdown from negative cloud-to-ground flashes at close distance
Helin Zhou, Baoyou Zhu, Shanchang Tao

S4-40 A New Return Stroke Model Based on State-Space Equations
S. Visacro, M. H. Murta Vale, A. P. Silva, F. H. Silveira

S4-41 Laboratory characterization of the current produced by a negative leader during a step
I. L’Helgoualc’h , P. Lalande , P. Laroche, A. Broc, P. Blanchet, C. André, L. Tamin, C. Campo

S4-42 The effect of air density on atmospheric electric fields required for lightning initiation from a long conductive object above ground
E M Bazelyan, Yu P Raizer, N L Aleksandrov, A M Konchakov

S4-43 On the NOx production by laboratory discharges and lightning
Vernon Cooray, Mahbubur Rahman and Vladimir Rakov

S4-44 Optical Evidence of Bi-directional Leader Process in Altitude-triggered Negative Lightning
Weitao Lu, Yijun Zhang, Xiuji Zhou, Dong Zhen, Qing Meng, Ming Ma

S4-45 Parameters of dart-leader return strokes in artificially-triggered lightning
Jing Yang, Xiushu Qie, Qilin Zhang, Yunjun Zhou, Yang Zhao, Xiangzhen Kong, Guili Feng, Tinglong Zhang, Qingfu Xiao

S4-46 Simultaneous observations of optical and electrical signals and Pattern Recognition research in lightning flashes
Li Peng , Zheng Yi, Zhang Yi jun

S4-47 Signatures of electric field changes associated with the continuing current stage of cloud-to-ground flashes
P. Baranski, S. Michnowski, G. Maslowski, W. Gajda

S4-48 Statistics analysis of characteristics of continuing current in CG lightning over the central Tibetan plateau
XIE Yi-ran, QIE Xiu-shu, ZHANG Tong

S4-49 Study on waveshapes of continuing currents and properties of M-components observed in natural negative and positive cloud-to-ground flashes using a high-speed camera
Leandro Z. S. Campos, Marcelo M. F. Saba, Osmar Pinto Jr., Maurício G. Ballarotti

S4-50 The Plasma Characteristic of Lightning channel
Huaming Zhang , Ping Yuan

S4-51 The relationship between first and subsequent stroke electric field peak in negative cloud-to-ground lightning
A.Oliveira Filho, W. Schulz, M. M. F. Saba, O. Pinto Jr. and M. G. Ballarotti

S4-52 Test of the Image Converter Cameras Complex for Research of Discharges in Long Air Gaps and Lightning
Vitaly B. Lebedev , Grigory G. Feldman, Boris N. Gorin, Yuri V. Shcherbakov, Vladimir S. Syssoev, Vladimir A. Rakov

S4-53 The simulation study on beneficial factor of various lightning flash initiation
Yongbo Tan, Shanchang Tao, and Baoyou Zhu

S4-54 The slow front and fast transition in close electric and magnetic field and field-derivative waveforms produced by first strokes of natural lightning
J. Jerauld, M. A. Uman, V. A. Rakov, K. J. Rambo, D. M. Jordan, and G. H. Schnetzer

S4-55 Triggering of lightning by series of femtosecond laser pulses
Nikolay A. Bogatov

S4-56 Lightning and electrical activity during the 2006 eruption of Mt. Augustine
R.J. Thomas, P.R. Krehbiel, W. Rison, H. Edens, S.R. McNutt, G. Tytgat

S4-57 Wavelet Based detection and fractal analysis of Radiation Fields by lightning Return Stroke
Xueqiang Gou, Yijun Zhang, Wansheng Dong , Xiushu Qie

S4-58 Nonlinear properties in time dynamics of Lightning Radiation Pulse Event Sequences
X. Gou, Y. Zhang, W. Dong, Q. Zhang

S4-59 A new lightning return stroke model based on transmission line theory including corona effects
Vernon Cooray and Vladimir Rakov

S4-60 On influence of the corona charge layer near ground on return-stroke peak current
Vernon Cooray, Marley Becerra, Kenneth L. Cummins and Vladimir Rakov

S4-61 Propagation effects caused by stratified ground on the electromagnetic fields generated by lightning discharges
Vernon Cooray and Kenneth L. Cummins

Session 5: Lightning and meteorology - operational application and basic research

Session 6: Lightning and climate

Thursday, 16 August **14:00-18:00**

Chairperson: D.M. Mach

Richard Blakeslee

S5-6 FLASH: A new EU project using lightning data to study Mediterranean flash floods
C. Price, Y. Yair, A. Mugnai, K. Lagouvardos, M.C. Llasat and S. Michaelides

S5-7 Electric field and lightning observations in the core of category 5 hurricane Emily
Richard J. Blakeslee, Doug M. Mach, Monte G. Bateman, Jeff C. Bailey

S5-8 Evolution of the Total Lightning Structure of a Leading-line, Trailing-stratiform Mesoscale Convective System over Houston, Texas
Brandon L Ely, Richard E. Orville, Lawrence D. Carey, and Chas Hodapp

S5-9 Forecast of thunderstorms with the help of numerical model and assessment of its reliability
Julia Dovgaluk, Terrence Krauss, Lenina Pivovarova, Andrey Sinkevich, Vladimir Stepanenko, Nikolai Veremei

S5-10 High-resolution WRF forecasts of lightning threat
S. J. Goodman, E. W. McCaul Jr., K. M. LaCasse

S5-11 Lightning, Electric Field, and Radar Observations of the STEPS 25 June 2000 Multicell Storm
W. David Rust, Stephanie A. Weiss, Donald R. MacGorman, Eric C. Bruning, Paul R. Krehbiel

S5-12 Lightning as a Precursor of Atlantic Hurricane Activity
Colin Price, Yoav Yair and Mustafa Asfur

S5-13 Lightning initiated in the anvil of a supercell storm
Kristin M. Kuhlman, Donald R. MacGorman, W. David Rust, Paul Krehbiel, and Bill Rison

S5-14 Lower atmospheric radar observations of thunderclouds in summer
Yoshitaka NAKAMURA, Manabu AKITA, Takeshi MORIMOTO, Tomoo USHIO, Zen-Ichiro KAWASAKI

S5-15 Mesocale Lightning in West African Squall Lines and its Global Detection with ELF

Measurements
Y. Hobara, E. Williams, R. Boldi, G. Satori, J. Bor, W. Lyons, T. Nelson, M. Hayakawa, N. Nathou,B. Russell

S5-16 Mesoscale Thunderstorm and Lighting Numerical Prediction
Guo Hu and Chen Daren

S5-17 Narrow bipolar events, strong vhf pulses and the detection of severe weather from GPS orbit
D. M. Suszcynsky and K. C. Wiens

S5-18 Opportunities for using of atmospheric electric field data in forecasting unfavourable weather conditions
I.A. Krushatina , G. G.Shchukin, Ya. M. Shvarts

S5-19 Radar way of separation of convection clouds on thunderstorm and not thunderstorm with applying of a method of pattern recognition
Salukvadze Tamaz, Khelaia Etheri, Kiria Djemal

S5-20. Relationships among narrow bipolar events, total lightning, and radar-inferred convective strength in U.S. great plains thunderstorms
Kyle Wiens, David Suszcynsky

S5-21 Relationship between lightning activity and precipitation in the Mediterranean
S. Petrova, R. Mitzeva, V.Kotroni and J.Latham

S5-22 Relationship between lightning location and polarimetric radar signatures in an MCS
N. Lund, D. MacGorman, D. Rust, T. Schuur, P. Krehbiel, W. Rison, T Hamlin, J. Straka, and M. Biggerstaff

S5-23 Relationship between Precipitation and Lightning in Convective Storm of Northwestern China
Fengxia Guo, Yijun Zhang, Muhong Yan

S5-24 Recent observations of total lightning, hurricane lightning and TGF-producing lightning activities with the Los Alamos Sferic Array (LASA)
Xuan-Min Shao, Jeremiah Harlin, Timothy Hamlin, Kyle Wiens, David Suszcynsky, and Mark Stanley

S5-25 An analysis of lightning temporal and spatial characteristics during the fierce convective weather over north China
Dongxia Liu, Xiushu Qie, Guili Feng

S5-26 Analysis of the Relationship Between Lightning and Charge Structures in Thunderstorm Cloud Using Satellite Image and Radar Data
Yizhou Yin, Weimin Chen, Zhaorong Li and Xia Luo

S5-27 Characteristics of Cloud-to-ground Lightning of Squall Line on April 28 2006
Guili Feng, Xiushu Qie, Jun Wang

S5-28 The Primary Application Research of Radar Data for the Lightning Warning of Isolated Storm Cells in Beijing
Wang Fei, Zhang Yijun, Lu Weitao, Meng Qin

S5-39 A Primary Study of Lighting Simulation by Numerical Model and Chinese Doppler Radar Data Assimilation
Yanrong Yang, Zhenhui Wang, Tianqing Zou

S5-30 Electricity of the mid-latitude atmosphere as coupled to meteorological conditions over the

upper VOLGA region
E. A. Mareev, S.V. Anisimov, V.V. Sokolov, A.A. Panyutin, U.V. Shlugaev, V.V. Klimenko, N. M. Shikhova, D.I.Iudin

S5-31 Preliminary analysis of Characteristics of Summer lightning over the central Lower Latitude Plateau of China
XIE Yi-ran, ZHANG Te-fei, LIU Xue-tao, XU Kai

S5-32 The characteristics of a downburst from Flash and Doppler radar data in central part of Shannxi Province
Luo Hui, Bi Xu, Gao Juxia, Li Mingjuan

S5-33 Effects and Mechanisms of Topography on Lightning Activity over Taiwan Island
Jianhua Dai, Yuan Wang, Lei Chen , Hong Lin

S5-34 A Comparison of Lightning Activity and Convective Indices over Some Areas of China
Jianhua Dai, Yuan Wang, Jianfeng Gu, Lei Chen , Zhi Wang

S5-35 The Application of LLS And Sounding Data Over Nanjing
Biao Zhu, Zhenhui Wang , Xingyou Huang, Minxue Feng

S5-36 Nowcasting and warning system of lightning in CMA
Meng Qing, Lu Weitao, Zhang Yijun, and Zhou Xiuji

S5-37 Beijing Thunderstorms Monitor and Prediction/Warning System
Guo Hu and Chen Daren

S5-38 Diurnal variation of lightning and rainfall activity on an exceptionally heavy rainfall day over Mumbai
S.S. Kandalgaonkar, M.I.R. Tinmaker and M.K. Kulkarni

S6-7 The Intracloud/Cloud-to-ground Lightning Ratio in Southeastern Brazil
P.E. de Souza, O. Pinto Jr, I.R.CA. Pinto, N. J. Ferreira, A. F. dos Santos

S6-8 Atmospheric Factors governing Winter Lightning Activity in the area of Tel-Aviv, Israel
Baruch Ziv, Hadas Saaroni, Yoav Yair, Michal Ganot, Anat Baharad

S6-9 Characteristics of Thunderstorm Activity in Dusheti
Avtandil Amiranashvili, Albert Nodia

S6-10 Climatological Distribution of Lightning Density Observed by Satellites in China and Its Circumjacent Regions
Ma Ming, Tao Shanchang, Zhu Baoyou & Lu Weitao

S6-11 Climatology of thunderstorm activity over the Indian region: Latitudinal and seasonal variation
G.K. Manohar and A.P. Kesarkar

S6-12 Cloud-to-ground lightning characteristics in the AMAZON region between dry to wet season
Widinei A. Fernandes, Iara R.C.A. Pinto, Osmar Pinto Jr,

S6-13 First mapping of the lightning severity in Belgium
Christian Bouquegneau, Pierre Lecomte, Laurent Remmerie

S6-14 How a Polluted Atmosphere Affects Lightning
Richard Orville, Larry Carey, Brandon Ely, Joe Jurecka, Chas Hodapp, Scott Steiger, Nathan Clements, and Shane Motley

S6-15 An analysis of climatic characteristics of thunderstorms over the rainage area of Qinghai Lake in China

Yunjun Zhou, Dunjun Zhou, Guili Feng and Tie Yuan

S6-16 Lightning behavior with respect to altitude variations at Rio Grande do Sul (South of Brazil) based on data of the Brazilian Lightning Detection Network
Vandoir Bourscheidt, Osmar Pinto Jr. and Iara R.C.A. Pinto

S6-17 Maximum cloud-to-ground lightning densities on earth as observed by lightning location systems
O. Pinto Jr., I.R.C.A. Pinto and K.P. Naccarato

S6-18 CG lightning activity over Brazil based on VLF, LF and LIS data
Kleber P. Naccarato, Osmar Pinto Jr., Robert H. Holzworth

S6-19 Variability of global lightning activity on the enso time scale
G. Sátori, E.Williams, I. Lemperger

S6-20 Response of a global circuit model with stratospheric and tropospheric aerosol to cosmic ray flux changes
Limin Zhou, Brian A Tinsley

S6-21 Lightning activity and pollution over Paris area between 1992 and 2003
Marie-Pierre Boussaton and Sylvain Coquillat

S6-22 Cloud-to-ground lightning flashes observations in warm season, Brazil: 2004-2006
Rosangela Barreto Basi Gin, Cesar Beneti, Augusto José Pereira

S6-23 Research of the lightning rule in SUZHOU
Li Xia , Wang Zhenhui, Xiao Wenan

S6-24 Statistical analysis of lightning data in Jiangsu province
ZHAO Xuhuan, WANG Zhenhui, ZHU Biao,SHI Guangqun,

S6-25 Analysis of time and spatial distribution of Lightning Characteristics in Shanghai
Gu Yudan, Dai Jianhua, Xu Xiaodong

S6-26 Land-ocean contrast in lightning activity over the Indian region
S.S. Kandalgaonkar, M.I.R. Tinmaker, M.K. Kulkarni and J.R. Kulkarni

Session 7: Electrical effects of thunderstorms on the middle and upper atmosphere
Session 9: Lightning Effect and its Protection

Friday, 17 August **14:00-16:15**

Chairperson: Mingli Chen

Guili Feng

S7-7 Analysis of lightning activity in two thunderstorm systems producing sprites in France
Aglika Savtchenko, Rumjana Mitzeva, Staycho Kolev

S7-8 Cellular automation modeling of sprite fine structure
M. Hayakawa, D.I. Iudin, E. A. Mareev, V.Yu. Trakhtengerts

S7-9 Effects of lightning m-components in the middle atmosphere
S.A. Yashunin, E. A. Mareev, V.A. Rakov

S7-10 ELF transients associated with TLEs observed during ILAN2006 campaign

Eran Greenberg, Colin Price, Yoav Yair, Michal Ganot, Jo'zsef Bór, Gabriella Sátori

S7-11 On the Initiation of Upward Discharges Above Thunderstorms
Paul Krehbiel

S7-12 On the possibility of Sprites in other Planetary Atmospheres
Yoav Yair, Davis Sentman, Yukihiro Takahashi and Roy Yaniv

S7-13 Q-bursts from various distances on the Earth
Toshio Ogawa, Masayuki Komatsu

S7-14 Analysis of thunderstorm systems and lightning activity associated with sprites observed during the Eurosprite campaigns 2- Case studies
Serge Soula, Oscar van der Velde, Joan Montanyà, Ágnes Mika, Christos Haldoupis, Torsten Neubert, Michal Ganot

S7-15 Possible high altitude discharge due to narrow bipolar events
Zhuang Baotong, Zhu Baoyou, Tao Shanchang

S7-16 Gamma-Ray Flashes and Neutron Pulses Produced by Gigantic Upward Atmospheric Discharges.
L.P. Babich, A.Yu. Kudryavtsev, M.L. Kudryavtseva, I.M. Kutsyk

S9-4 A new analysis tool to evaluate the impact of lightning on distribution lines
O. Pinto Jr., V. L. G. Gardiman, M. Martino

S9-5 A new calculating method to grounding resistance of multi-parallel grounding-rods
Zhang Xiaochun, Xu Chonghao

S9-6 Analysis on correlation between lightning data and lightning casualties and property damage in China
Ma Ming, Lu Weitao, Zhang Yijun & Meng Qing

S9-7 Broken Characteristic of Curved Copper Wires due to Lightning High Impulse Current
Xiaobo Hu, Tsuginori Inaba, Christoph Lederle, Josef Kindersberger, Toru Iwao, Takahiro Otsuka

S9-8 Importance of Forecasting in Preventive Lightning Protection
A． Gulyás, B. Németh, I. Kiss

S9-9 Increasing safety in live line maintenance applying preventive lightning protection
B. Németh, A. Gulyás, I. Berta

S9-10 Non-serious lightning effects on human beings
N. Kitagawa, M. Ohashi and T. ISHIKAWA

S9-11 Point discharge currents from a sharp-tipped lightning rod due to lightning
Mingli CHEN and Yaping DU

S9-12 Possible impacts of the earthing path impedance on the lightning stroke current
M*ingli CHEN, Man Kai YUEN and Yaping DU*

S9-13 The effect of wind on corona processes near grounded objects and their ability to attach lightning
E M Bazelyan, N L Aleksandrov, F D'Alessandro and Yu P Raizer

S9-14 A thunderstorm and lightning alert service for airport operations
Rodney Potts, John Bally, Ted Williams

S9-15 The research of operating duty test for the low-voltage SPDs
Ren Xiaomin , Cai Zhenxin, Fu Zhengcai

S9-16 Experimental Study on Lightning Characteristic of Electronic Equipment's Power Supply
Chai Yajing, Zhou Wenjun, He Ruidong,Zhao Luxing

S9-17 Application Research of Electric Field on Ground Detecting Technique
Xu Xiaodong, Wang Qiang, Wang Jianchu

S9-18 An analysis of the lightning strike disaster of large-size oil tanks in Yizheng & a recommended protection method
Minxue Feng, Hui Luo,Xue Jiao

S9-19 Potential vulnerability analysis and vulnerability zoning of thunderstorm disaster in Shanghai
Wang Qiang, Wang Jianchu

S9-20 A study on signal SPD and its interference effect on the signal streams in a computer network
SHI Guangquan, WANG Zhenhui

S9-21 Vulnerability analysis evaluation and vulnerability zoning of lightning disaster in Beijing
Xiong Yajun, Guo Hu

S9-22 An approach to problems of risk Management for Structures containing sensitive equipment due to lightning flashes
Chunyan Zhang, Wen'an Xiao

S9-23 Estimating the channel base current in the triggered-lightning experiment
Heming Ren, Bihua Zhou

S9-24 PML for FDTD calculation of fields generated by lightning return stroke
Xianjin Li, Bihua Zhou, Bin Chen, Jian Ma, Shenyuan Gu, Weidong Fu, Qiang Chen

S9-25 Lightning Attachment on Overhead Telephone Line: Experience from Tanzania Telephone Network
Jacqueline Damas, Nerey H. Mvungi and Mighanda J. Manyahi

S9-26 Lightning discharges to wind turbines in winter
Atsushi Wada, Shigeru Yokoyama, Akira Asakawa, Kazuo Hachiya

Friday, 17 August	**Friendship Palace, Friendship Hotel**
16:15-17:00	**Closing Ceremony**

INTERNATIONAL CONFERENCE ON LIGHTNING AND STATIC ELECTRICITY 2007 - (ICOLSE 2007)

The **ICOLSE 2007** will be held at Université Pierre et Marie Curie in Paris, France, from **28-31 August 2007**.

This Conference will be concerned with all aspects of lightning interaction with ground, air and sea systems and human beings.

The website of the conference is: http://www.icolse.org/

Key Dates:

Reviewing of Submitted papers	30 May 2007
Notification of Revisions	30 June 2007
Final Submission of revised papers	10 July 2007
Conference	28 –31 August 2007

The Chairman for ICOLSE 2007 is Jean-Patrick MOREAU Dassault Aviation (Saint-Cloud) Assisted by European and USA Technical Committees

For booking and general information please contact Eurocae after January 20 2007

IX INTERNATIONAL SYMPOSIUM ON LIGHTNING PROTECTION (SIPDA)

Prof. Alexandre Piantini, Chairman of the IX SIPDA is very pleased to announce the IX International Symposium on Lightning Protection - IX SIPDA – which will be held in Foz do Iguaçu, Brazil at the Rafain Palace Hotel & Convention Center from 26th to 30th November, 2007.

The event is organised by the Institute of Electrotechnics and Energy of the University of São Paulo - IEE/USP - with the support of The Institute of Electrical and Electronics Engineers - South Brazil Section - IEEE.

The aim of the Symposium is to present and discuss recent developments concerning lightning modelling and measurement techniques, as well as grounding and lightning protection. The event covers all aspects related to lightning, with emphasis on the following topics:

1) lightning physics, characteristics and measurements
2) lightning detection and location systems
3) lightning protection of substations and transmission lines
4) lightning protection of medium and low voltage distribution lines
5) lightning protection of structures and installations
6) lightning protection of electronics and telecommunication systems

7) grounding
8) lightning electromagnetic fields and electromagnetic compatibility
9) equipment
10) testing and standardisation
11) lightning-caused accidents and injuries

For further information about the Symposium, please visit the web site at: http://www.iee.usp.br/sipda or contact us through the e-mail: sipda@iee.usp.br .

2007 AGU FALL MEETING

The fall meeting of AGU will be held on **10-14 December 2007**, at the Moscone Center West, 800 Howard Street, San Francisco. (**http://www.agu.org/meetings/fm07/**)

The deadline to propose **sessions** for the section AE (Atmospheric and Space Electricity) is : **13 June 2007**.
(http://submissions3.agu.org/specialsession/sessionlist.asp?t=14583.33)

The chairman of the section AE is Victor Pasko :

> Victor P. Pasko, Department of Electrical Engineering, Communications and Space Sciences Laboratory, Pennsylvania State University, 211B Electrical Engineering East, University Park, PA 16802-2706, USA; Phone: +1-814-865-3467; Fax: +1-814-865-7065; E-mail: vpasko@psu.edu

2008 EGU GENERAL ASSEMBLY

The General Assembly 2008 of the European Geosciences Union (EGU) will be held in **Vienna**, Austria, on **13 – 18 April 2008**

The EGU General Assembly covers all disciplines of the Earth, Planetary and Space Sciences. Especially for young scientists the EGU appeals to provide a forum to present their work and discuss their ideas with experts in all fields of geosciences.

The website address of the assembly is :
http://meetings.copernicus.org/egu2008/index.html

Deadline and Milestones

The deadlines and milestones are visible at the address :
http://meetings.copernicus.org/egu2008/deadlines_and_milestones.html

20th ILDC (INTERNATIONAL LIGHTING DETECTION CONFERENCE)
2nd ILMC (INTERNATIONAL LIGHTNING METEOROLOGY CONFERENCE)

Vaisala will present the 20th International Lightning Detection Conference (ILDC) 21-23 April 2008 and the 2nd International Lightning Meteorology Conference (ILMC) 24 - 25 April 2008.

The 20th ILDC will provide a forum for presentations and discussion related to advances in lightning detection technology, network performance evaluation, and fundamentals of lightning physics and current research.

The 2nd ILMC will focus on applications of lightning data related to thunderstorm nowcasting for the meteorological and aviation communities, oceanic extratropical and tropical cyclone nowcasting, and data assimilation into numerical weather prediction models.

Both events will be held in Tucson, Arizona USA at the Marriott Tucson University Park.

Important Dates:

Abstracts due	3 December 2007
Acceptance notification will begin	7 January 2008
Final papers due	29 February 2008
ILDC Conference	21-23 April 2008
ILMC Conference	24-25 April 2008

Call for papers and updated conference information will be available at www.vaisala.com/ILDC in July 2007. Please send any questions to ildc@vaisala.com.

ICLP 2008

From 23rd to 26th of June 2008, the 29th International Conference on Lightning Protection (ICLP) will be held in Uppsala, Sweden.
http://www-conference.slu.se/ICLP2008/index.html

The Conference will be located in Uppsala University : http://www.uu.se/

Several topics in the field of lightning physics and lightning protection will be investigated at this Conference:

- Lightning discharge
- Lightning occurrence characteristics
- Lightning electromagnetic pulse
- Lightning attachment
- Lightning down conductors and grounding
- Lightning protection of power systems

- Lightning protection of electronic systems
- Lightning deleterious effects
- Practical and specific lightning protection problems
- Lightning protection of windmills and other alternative power systems,
- Lightning testing standards.

AIRBORNE RESEARCH ASSOCIATES (Weston, MA, USA)

Ralph Markson (rmarkson@comcast.net)

A recently published article, "The Global Circuit Intensity: Its Measurement and Variation over the Last 50 Years", Bull. Amer. Meteorol. Soc. 88, Feb. 2007, 223-241 (available electronically from the author), integrates all 599 measurements of ionospheric potential (Vi) made by the three programs that have measured it: J. Clark (Naval Research Laboratory,1955-1956), R. Mühleisen and H.-J. Fischer (Univ. Tübingen, Weissenau, 1959-1976) and R. Markson (Airborne Research Associates, 1971-2004). Included is discussion of the factors that prevent reliable measurements of global circuit variation from being obtained on the ground including: the electrode effect, electrified particles in the air, changes in local vegetation and man-made factors such as nuclear radiation and pollution. The most reliable data are obtained with electric field Vi soundings in clean-air cloud-free regions over the ocean. Reliability is verified by observing the Carnegie curve diurnal variation in a single day's series of measurements. The effects of continental-scale temperature variation on the global circuit intensity are also reported.

Following is a summary of findings and the relevance of the global circuit and related phenomena to global change research:

1. Atmospheric nuclear testing was highly correlated with an increase in the global circuit intensity (Vi magnitude) by as much as 40% during the period 1960 through 1964. In 1961 and 1962, just before the scheduled onset of the Atmospheric Nuclear Test Ban Treaty in 1963, the USSR and USA conducted extensive atmospheric nuclear testing. Most of the radioactive debris occurred in the 60-64 period when the Vi anomaly is apparent. There is about a one-year residence

time for atmospheric nuclear debris.

2. Following the nuclear testing period there has been no apparent secular variation in Vi, which has averaged 240 kV, since 1966. This indicates that reports of Earth's electric field intensity decreasing during the twentieth century based on ground level measurements are not valid.

3. The positive correlation between atmospheric nuclear radiation and Vi supports the hypothesis that galactic cosmic radiation modulates the global circuit intensity through changes in ionization over and near deep convective clouds and not in fair-weather regions which would partially short out Vi.

4. The annual max-to-min Vi variation is about 15% of the mean with a maximum in August (September and October are almost as high). August is also the maximum in the annual lightning variation observed from space and global surface air temperature in the +/-60º latitude zone. The minimum of Vi is in the Northern Hemisphere winter, but there were not enough winter soundings to identify the specific month.

5. Temperature over Africa and South America are positively correlated with Vi in the morning and negatively correlated with Vi in the afternoon. The apparent reason is that enhanced morning convective activity leads to greater afternoon cloudiness that shields the ground from solar radiation later in the day.

6. Ionospheric potential data provides a means for monitoring global thunderstorm and electrified convective shower cloud activity. This deep convection provides all the upward transport of water vapor to the upper troposphere and stratosphere, and water vapor is the most important greenhouse gas contributing to global warming both day and night. Thus, temperature enhanced deep convection provides positive feedback to global warming while resulting cirrus clouds would reduce radiative heating.

7. Nocturnal clouds and water vapor from the previous day's convective activity will reduce the rate of radiational cooling at night. This may explain why most of the observed global warming signal comes from higher nighttime temperatures rather than from higher daytime temperatures.

8. It is not possible to detect the long-term variation of Vi to global warming since the sensitivity ratio of Vi to temperature by percent is 16% to 1%. Thus the reported approximate 0.4ºC increase in global temperature over the last four decades, a 0.1% change in temperature, would produce too small an effect (0.1% temperature = 1.6% Vi = 4kV) to be detected in the past Vi data. In the future, with further refinement of measurements, Vi variation may provide a relatively simple method to study global change.

Global temperature variation data have utilized hundreds of measurements all over the world and complex satellite technology. Measurement of the global circuit, with a single Vi sounding, offers a new way to study global convection variation. While the global warming problem has focused on CO_2 emission, natural convective activity, which can be monitored through the variation of the DC and AC global circuits, must play a central role in climate change.

ATMOSPHERIC ELECTRICITY GROUP (ELAT) – BRAZILIAN INSTITUTE OF SPACE RESEARCH (Sao José dos Campos – Brazil)

The last recent activities of ELAT includes: the first results of the 53-sensor Brazilian lightning detection network, presented in November 2006 in the II International Conference on Lightning Physics and Effects; a new campaign to observe lightning with high-speed cameras, in two different regions in Brazil in the summer of 2007; the end of triggered lightning activities at the INPE facilities. The future of this type of observation in Brazil is being discussed.

For the ICAE Conference in China in August 2007 some results that should be presented are: new evidences of the role of the pollution on the lightning activity in large urban areas (to be presented in the ICAE in China); a simple rule of determine the lightning season on a given place; first observations of intracloud to cloud-to-ground flash ratio in Brazil; a new lightning detection efficiency model for LF networks; the relationship between first and subsequent stroke electric field peak in negative cloud-to-ground lightning.

ATMOSPHERIC ELECTRICITY GROUP - PHYSICS DEPARTMENT AT THE UNIVERSITY OF MUNICH (Garching, Germany)

Since 2006 lightning data from LINET, the new European Lightning Detection Network operating solely in the VLF/LF range, is available for large parts of Europe and can be analysed for a variety of scientific questions. Many different research groups use LINET data, because it comprises both cloud-to-ground strokes and in-cloud events with relatively small signal amplitudes ('total lightning'). In order to enhance collection of weak lightning events additional sensors are being placed in many countries. Given adequate sensor baselines, LINET reports the emission altitude of in-cloud lightning. Quality control has been carried out by means of comparisons with many other data sources. Most recently, the high location accuracy could be verified by pinpointing towers, which have been repeatedly struck by lightning.

The Munich group pursues research with the goal to enlighten the new finding that cloud discharges produce copious signals in the VLF/LF range, easily measured by the same equipment used to detect ground strokes. In fact, all comparative studies so far carried out in numerous countries where data from VHF systems are available, have shown that cloud lightning located with LINET is as informative as the one obtained from VHF techniques which are sensitive to a different part of the lightning process. The underlying discharge mechanisms have not been adequately described in the literature. A first descriptive attempt to improve this situation is made in a paper, which is published in the new Journal of Lightning Research (Betz et al. 2007).

Our group provides European lightning data for research projects of very different kind. Among many such projects COPS (convective precipitation studies) is now

under way and combines efforts and technical resources on an international basis. LINET data will be used for mission planning in the operational centre and for correlation studies of convective cells. In one contribution DLR placed its research radar station (POLDIRAD) near Strasbourg and deploys its LINET lightning sensors temporarily around the radar site in order to better locate in-cloud lightning.

AUSTRIAN LIGHTNING RESEARCH ACTIVITIES BY OVE-ALDIS AND THE VIENNA UNIVERSITY OF TECHNOLOGY (Vienna, Austria)

Lightning to the Gaisberg Instrumented Tower:
Currents waveforms of lightning strikes to an elevated radio tower are measured at Gaisberg, a mountain next to the City of Salzburg in Austria, since 1998. This project was initially started with the aim to evaluate the performance of the Austrian lightning location system ALDIS. On average about 50 flashes are recorded annually and almost all these flashes are initiated by an upward leader as typical for elevated objects. The overall current waveforms are measured at the base of the air terminal installed on the top of the tower with a current viewing resistor of 0.25 mΩ (bandwidth of 0 Hz to 3.2 MHz). Two separate fibre optic channels of different sensitivity are used: 0-2 kA to measure low amplitude currents like the initial continuing current (ICC) and 0-40 kA to measure return stroke peak currents. In 2006 two fast E-field antennas were installed at distance of 170 m (near field) and about 80 km (far field), respectively, for simultaneous recording of the time correlated E-field pulses. These two-station field records in combination with the measured current waveform at the tower top provide valuable input for various lightning research topics as (1) the evaluation of return stroke models, (2) effect of elevated towers on the radiated fields and (3) effect of finite ground conductivity on the propagating fields. In May 2007 a new field mill was installed at a distance of 170 m to the tower for monitoring the slow field changes during thunderstorm activity around the Gaisberg tower site.

LLS Performance Evaluations Based on Continuous E-field records:
A system for continuous and GPS time stamped field recording (5 MS/s) was developed by ALDIS and the Vienna University of Technology. Despite of the large amount of data (600 MB/minute) this system offers a variety of possibilities for lightning research. First priority for the Austrian research group is the performance evaluation of the lightning location system ALDIS. Quality of CG and IC classification as well as stroke and flash detection efficiency can be evaluated by visual inspection of the field pulses that are time correlated with strokes located by the ALDIS network. Independent from the lightning location system flash multiplicity, interstroke intervals and other lightning parameters are determinable based on these continuous field records.
www.aldis.at

COLORADO STATE UNIVERSITY - RADAR METEOROLOGY GROUP (Ft. Collins, CO, USA)

Steve Rutledge, Walt Lyons, and Timothy Lang are studying the structure, organization, and evolution of sprite-generating convection. During summer 2007, they will document the radar structure of sprite-generating mesoscale convective systems (MCSs) in the central United States using a combination of NEXRAD radar data and low-light television (LLTV) cameras scattered throughout the United States. They will develop a database of optically detected sprites for each case where they occurred, link this information to the parent positive CG discharge and impulse charge moment change, and reveal the possible dependence of sprite generation on the vertical structure of the stratiform region, as well as MCS organization. Sprite-generating supercells also will be included in this sample, should they occur.

Steve Rutledge, together with Sarah Tessendorf (NOAA/CIRES) and Kyle Wiens (Los Alamos National Lab) are continuing analysis of data from STEPS 2000. In particular, the 22 June storm has been studied in detail. This storm produced what was originally thought to be a large number of positive cloud-to-ground flashes near in time to the merger of two strong cells. Overall the merged storm was quite intense, exhibiting strong, broad updrafts, large quantities of hail, and extraordinary total flash rates as high as 500 min^{-1}. However, the Los Alamos Sferic Array (LASA) indicated that many of the positive CG strokes were actually Narrow Bipolar Events (NBEs). Studies are now underway to assess why this storm produced frequent NBE's, and not positive CG's. The internal charge structure was described as an inverted tripole.

DEPARTMENT OF EARTH AND ATMOSPHERIC SCIENCES – NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION COOPERATIVE REMOTE SENSING SCIENCE AND TECHNOLOGY CENTER, NOAA-CREST, THE CITY COLLEGE OF NEW YORK (New York, New York, 10031, USA)

Ali S. Amirrezvani, Shayesteh E. Mahani, and Reza M. Khanbilvardi
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Developing A Rainfall Estimation Algorithm using Multi-Source Remotely Sensed IR and Lightning Data

ABSTRACT

Lightning-rainfall studies have demonstrated that rainy cloud with colder top temperature (T_b) and with stronger lightning activity generally produces heavier

rainfall. The present study confirms the results of existing literature and shows that there is a strong correlation between lightning (L) and rainfall (e.g., cc = 0.72). The objective of this study is to develop a satellite-based rainfall retrieval algorithm for estimating high-resolution rainfall for summer thunderstorms. High-resolution cloud-top infrared brightness temperature (IR-T_b) from geostationary satellite (GOES) in conjunction with lightning from the National Lightning Detection Networks (NLDN) is used for rainfall estimation. We applied an artificial neural networks algorithm for estimating rainfall from the combination of two variables IR-T_b and lightning. The two variables are used for classifying different cloud types. Our preliminary results demonstrate that using lightning in addition to IR-T_b increases the accuracy of rainfall estimate (e.g., cc = 0.7674). The presented results are for a short time storm in July 2002 over an area with latitude 32^o-38^oN and longitude 104^o-112^oW in a mountainous region.

FMA RESEARCH, INC. - YUCCA RIDGE FIELD STATION, (Ft. Collins, CO, USA)

Summer 2007 will see another sprite campaign directed from Yucca Ridge. FMA will be joined by Bob Marshall (Stanford) who will obtain photometric measurements and high-speed imagery of sprites to complement the normal suite of camera and VLF systems. FMA has established a cooperative Sprite Net system, in which 5 institutions are hosting low-light camera systems and documenting TLEs above a wide variety of convective storm types. Cooperating institutions include Minnesota State University, Mankato, Duke University, Florida Institute of Technology, Texas A&M and the University of Oklahoma. In some cases, these cameras will be able to image TLEs above 3-D lightning mapping arrays. In a cooperative project with Colorado State University (Steve Rutledge, Tim Lang), the sprite parent lightning events will be analyzed in the context of the 3-D structure of their storms (using NEXRAD) and the total lightning discharge (using the LMA). In cooperation with Steven Cummer (Duke University), a prototype National Charge Moment Change Network (CMCN) is being established during summer 2007. This system will provide real-time location of CGs with impulse charge moment change values believed large enough to trigger TLEs. The real-time display will also provide guidance for the Spite Net camera operators. A climatology of TLE potential sources from the CMCN will be developed in conjunction with Gary Huffines (University of Northern Colorado). A low-light camera system was also operated during summer 2006 in Niamey, Niger by Earle Williams (MIT). Sprites have now been recorded from ground sensors above central African MCSs and are undergoing analysis. A paper on sprites and supercells (W.A. Lyons, S.A. Cummer, M.A. Stanley, K.C. Wiens, T.E. Nelson) has been submitted to the Bulletin of the American Meteorological Society.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY (Parsons Laboratory, Cambridge, Massachusetts 02139, USA)

Several papers have been completed and published involving several coauthors (Bob Boldi, Vadim Mushtak, Eric Downes, Stan Heckman, Walt Lyons, Gabriella Sátori, Phyllis Greifinger, Dick Dowden and Zen Kawasaki) in Victor Pasko's Special Issue on Schumann Resonances in Radio Science, in print in February, 2007.

Steve McNutt from the University of Alaska in Fairbanks visited MIT in March as part of an ongoing NSF investigation of the electrification of volcanic eruptions. More than 200 cases of lightning in eruption events worldwide have been compiled, a sufficient number to establish a flat dependence on geographic latitude. This result contrasts strongly with the latitude dependence of natural lightning, constrained by temperature-dependent water vapor. No latitudinal dependence of the magma water available for volcanic lightning is expected.

Collaborative work continues with the Université de la Guyane in Guadeloupe (Elizabeth Hicks, Nathalie Nathou and Constantin Pontikis) on African dust. The electrification in dusty gust fronts in Niamey, Niger in 2006 has been written up (with Brian Russell, Mark Miller and Mary Jane Bartholomew) for presentation in Beijing. Efforts continue to distinguish charging by contact with the Earth's surface and by particle collisions and differential motions under gravity aloft. We also continue to be interested in the possibility that dust lofted by the cold outflows from moist convection is contributing substantially to the trans-Atlantic transport of mineral aerosol. To improve on this understanding, 50 soil samples were collected in a 700 km road trip in March between Bamako and Timbuktu (Mali), along the gradient between 'red' Sahel and 'white' Sahara Desert. These samples will be analyzed for iron oxide as a possible tracer for the origin of the trans-Atlantic dust. We are also collaborating with Joe Prospero (University of Miami) and with Jean-Louis Rajot and Paola Formenti (IRD, Niamey) on the chemical analyses of the samples.

Work continues with Yasu Hobara on the large lightning flashes in the stratiform regions of African squall lines observed during the 2006 AMMA campaign in Niamey, Niger. Hobara presented some of these results at the recent EGU meeting in Vienna. These energetic events have now been detected by Schumann resonance receivers in Rhode Island (Bob Boldi, Vadim Mushtak, and Earle Williams), Hungary (G. Sátori and J. Bor), Israel (C. Price and E. Greenberg) and in Japan (M. Hayakawa and Y. Hobara). Quite recently, Walt Lyons has examined the video tape archive from Niamey and has found evidence for sprites over Africa, perhaps the first documentation of such from the ground in this continent. The existence of sprites in the most lightning-prevalent tropical 'chimney' is entirely consistent with the finding of large and energetic positive ground flashes in the squall lines.

Vadim Mushtak is working with a more accurate line shape for Schumann resonance spectra than the traditional Lorentzian previously in use in a recent paper in JGR (Williams, Mushtak and Nickolaenko, 2006). These new results will also

be presented in Beijing in August.

Gabriella Sátori and Earle Williams have written up their results on El Nino-related variations in global lightning activity first presented in Beijing at the IAMAS meeting in 2005 for the 4-page contribution for Beijing (again!) in 2007. The largest changes (El Nino to La Nina periods) are found in the subsidence regions of the Hadley and Walker circulations.

Earle Williams has returned again to the rich research notebooks of C.T.R. Wilson, now available outside the Royal Society Library on microfilm. This material provides new insight about the scientific interaction and long-standing controversy between G.C. Simpson and Wilson, ultimately resolved by the tripole structure of isolated thunderclouds in Simpson and Scrase (1937). This material is also under organization for the upcoming ICAE meeting in Beijing.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY (Lincoln Laboratory, Lexington, Massachusetts, USA)

The satellite-based study of oceanic convection has been aimed at diagnosing the hazard of deep convection to commercial aviation. This investigation utilizes NASA TRMM (Tropical Rainfall Measuring Mission) reflectivity profiles and LIS (Lightning Imaging Sensor) lightning observations to quantify internal conditions inaccessible to geostationary satellite observations, and has been accepted recently for publication in the Journal of Applied Meteorology.

THE UPPER ATMOSPHERE RESEARCH GROUP – DEPARTMENT OF SOLAR SYSTEM SCIENCE – DANISH NATIONAL SPACECENTER – DANISH TECHNICAL UNIVERSITY (Copenhagen Denmark)

The group has proposed a space mission for studies of sprites, jets, eves, and the terrestrial gamma-ray flashes. The mission is “The Atmosphere-Space Interactions Monitor” (ASIM). On April 1, 2007, ASIM began Phase B (detailed design phase), commissioned by the Human Spaceflight, Microgravity and Exploration Directorate within ESA. ASIM is an instrument suite to be mounted on an external platform on the International Space Station (ISS). ASIM will study the coupling of thunderstorms processes to the upper atmosphere, ionosphere and radiation belts and energetic space particle precipitation effects in the mesosphere and thermosphere. The scientific objectives include (1) investigations into sprites, jets, elves and relativistic electron beams injected into the magnetosphere above thunderstorms, (2) studies of gravity waves in the thermosphere above severe thunderstorms, (3) lightning-induced precipitation of radiation belt electrons, (4) auroral electron energetics, and (5) perturbations to ozone and NOx concentrations in the upper atmosphere. The instruments are 6 TV frame-rate, narrow-band, optical cameras

giving good spatial resolution in selected bands, 6 photometers giving high temporal resolution in the same bands, and one X-ray sensor. The ASIM mission provides an opportunity for scientists from the atmosphere and space sciences to come together in studies towards a common understanding of the coupled atmosphere – space system. The mission is supported by an international science team. Scientists interested in joining the mission preparations, for instance by planning for co-ordinated ground, aircraft or balloon campaigns during the mission, are welcome to join the science team and should contact Torsten Neubert, neubert@spacecenter.dk.

The group will support the EuroSprite2007 campaign that will start on July 1. One optical camera system will be mounted as usual at the Observatoire Midi Pyrénées and a second camera on Monte Corona, Corsica. The camera on Corsica is semi-autonomous, powered by solar cells and controlled over the Internet via a satellite link. The duration of the campaign will depend on the success of the camera systems. The cameras on Pic du Midi could potentially remain in operation also during the winter.

UNIVERSITY OF FLORIDA (Gainesville, Florida, USA)

Experiments will continue in Summer 2007 (for the 14th year) at the International Center for Lightning Research and Testing (ICLRT) at Camp Blanding, Florida. These include continued studies of the properties of natural lightning using multiple-station measurements of electric and magnetic fields and continued studies of the energetic radiation (X-rays, gamma-rays) during both natural and triggered lightning discharges using the new Thunderstorm Energetic Radiation Array (TERA), in collaboration with the Florida Institute of Technology. Additionally, correlated electric field measurements will be performed at the University of Florida Campus in Gainesville, at a distance of about 45 km from Camp Blanding.

Amitabh Nag defended his Masters thesis titled “Microsecond- and Submicrosecond-Scale Electric Field Pulses Produced by Lightning Discharges” and Jen Schoene defended his Ph.D. dissertation titled “Direct- and nearby-strike interactions of rocket-triggered lightning with unenergized power distribution lines”.

J. Jerauld, M.A. Uman, V.A. Rakov, K.J. Rambo, and G.H. Schnetzer authored a paper titled “Insights into the ground attachment process of natural lightning gained from an unusual triggered-lightning stroke”. Measured electric and magnetic field and current derivatives from an unusual triggered-lightning stroke that was initiated by a dart-stepped leader and involved an upward connecting leader are presented. The initial rising portion of the current waveform is composed of a “slow front” rising to 20 kA in 2.2 μs, followed by a “fast transition” from 20 to 27

kA in 0.2 μs. A similar slow-front/fast-transition sequence has been observed in the currents and in the distant radiation fields of natural lightning first strokes. Field derivatives measured at 15 and 30 m for the triggered-lightning stroke are similar to those measured for natural lightning
first strokes occurring within a few hundred meters. Two versions of the transmission line model, with the measured current derivative and assumed propagation speeds as input, are able to reasonably reproduce the slow fronts and fast transitions in the field derivatives measured at 15 and 30 m - the electric field slow front being primarily electrostatic - and predict the slow front in the distant radiation fields. These results suggest that the source of the slow fronts observed in the currents and in the distant radiation fields of natural first strokes is likely to be a pair of microsecond-scale current waves, each having a peak of up to some tens of kiloamperes, propagating in opposite directions from the junction of the downward and upward connecting leaders at a speed on the order of 10^8 m/s, rather than the upward connecting leader itself, as is often thought. The paper is published in the JGR.

M. Rahman, V. Cooray, V. A. Rakov, M. A. Uman, P. Liyanage, B. A. DeCarlo, J. Jerauld, and R. C. Olsen III authored a paper titled "Measurements of NOx produced by rocket-triggered lightning". The first direct measurements of NOx generated by specific lightning sources are presented. In July 2005, three negative lightning flashes were triggered using the rocket-and-wire technique at the International Center for Lightning Research and Testing (ICLRT) at Camp Blanding, Florida. The NOx produced by these three rocket-triggered flashes was measured. The NOx production per unit charge was between 2 and 3 x 10^{20} molecules per meter per coulomb. The data show that the NOx production is primarily from long-duration, steady currents, as opposed to microsecond-scale impulsive return stroke currents. This observation implies that cloud discharges, which transfer, via a steady current of the order of 100 A, larger charges than ground discharges, but do not contain return strokes, are as efficient as (or more efficient than) cloud-to-ground discharges in producing NOx. The paper is a result of collaboration of UF, Uppsala University, Sweden, and the University of Colombo, Sri Lanka. It is published in the GRL.

UNIVERSITY OF ULM, MATERIALS DIVISION, (Ulm, Germany)

In recent laboratory experiments we could visualize the presence of nanoscopic water layers on solid surfaces in air and their action at the solid-water interface (Sommer, A.P., and Pavláth A.E., The Subaquatic Water Layer. Crystal Growth & Design, 7, 18-24, 2007). While the implication of the nanoscopic water layers in the transfer of charge between ice particles is clear, very little is known on their nature. Apparently, their viscosity is significantly higher on hydrophilic surfaces than the viscosity of bulk water, whereas on hydrophobic surfaces they present a crystalline structure (at room temperature). Better cloud electrification models could emerge when these finding are implemented in current concepts. Current work is focusing

on understanding the coexistence of unordered and crystalline water layers at model surfaces in air. A chamber designed to evaporate water drops under extreme conditions, i.e., high levels of humidity, has been constructed and tested in Ulm. In it we could produce microtornadoes. The relevant conditions, i.e., vertical convection with warmer humid air at the ground and a stable cold front aloft, as well as wind shear, could be identified in the system generating the microtornadoes. The work has been commented by NewScientist.
http://www.newscientisttech.com/article/dn11848-labmade-microtornadoes-mimic-the-real-thing.html
(Andrei P. Sommer, samoan@gmx.net)

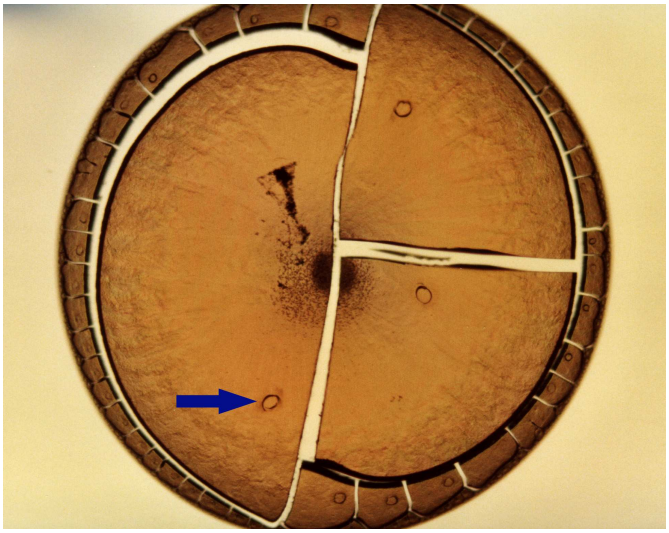

Photo : Number and distribution of vortex patterns (arrow) formed by microtornadoes in a crystalline igloo indicate that when conditions are favorable, microtornadoes necessarily form. Note the one-to-one ratio between igloo compartments and vortices. The igloo consists of nanospheres and has a diameter of 2.1 mm.

UNIVERSITY OF FRENCH POLYNESIA– LABORATOIRE TERRE-OCÉAN (Tahiti, French Poynesia)

Lightning Activity Analyses with Respect to the SPCZ Location : The South Pacific Convergence Zone (SPCZ) is stretches over the West Pacific warm pool Southeastward to French Polynesia. The Island Climate Update monthly publishes the mean location deduced from the total rainfall. On the other hand, the World Wide Lightning Location Network (WWLLN) monthly provides data from which the lightning activity distribution in the 0°-30° South latitude and 150°-240° West longitude area can be drawn. Scanning this rectangle from West to East allows the spots of maximum lightning activity to be located versus the longitude. Fitting the location of these maxima with a polynomial function leads to a curve comparable with the monthly mean position of the SPCZ, showing that this band of cloudiness is one of the main source of lightning in this whole area.
(accepted for publication at GRL)

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