

VIII WORKSHOP LIDAR MEASUREMENTS IN LATIN AMERICA PRE-WORKSHOP COURSE ON LIDAR



LatAm
Lidar
Network



HOTEL TRYP CAYO COCO / CUBA / 6 AL 10 / ABRIL / 2015





REPORT

VIII Workshop on Lidar Measurement in Latin America

April 6 – 10, 2015

Hotel Tryp Cayo Coco

Cayo Coco, Cuba





VIII Workshop on Lidar
Measurement in Latin
America

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Cayo Coco,
Cuba*

Participants

Lidar senior, young researchers and graduate students from Latin America and other regions from the rest of the world attended the VIII WLMLA. There were 41 total attendees to the workshop. The participants from Latin America's countries were 29: Argentina (1), Bolivia (2), Brazil (8), Chile (1), Colombia (5), Peru (2) and Cuba (10). There were twelve (12) attendees from other regions of the world: Spain (5), Germany (1), France (1), Netherlands (3), Japan (1) and United States (1). There were also representatives from European Space Agency (ESA). From the total of participants (41), 15 attendees were graduate students and the rest scientists and engineers.

Sponsors and Supporters

The VIII WLMLA sponsors institutions were the World Meteorological Organization – Global Atmospheric Watch (WMO - GAW), The Abdus Salam International Centre for Theoretical Physics (ICTP), European Space Agency (ESA), American Optical Society (OSA), International Geosphere-Biosphere Programme – Global Land Project (IGBP - GPL) and the companies LICEL and RAYMETRICS. The Atmospheric Optics Group of Camagüey, from the Meteorological Institute of Cuba (GOAC – INSMET) organized the School and the Workshop. It also contributed with the design, construction, maintenance and hosting of the workshop website and other organizational things. Additionally, the Laser Applications Center from Institute for Nuclear research (CLA – IPEN) from Brazil supported the printings for the workshop. The Grupo de Óptica Atmosférica from the University of Valladolid, Spain, will provide the funding necessary for publishing the papers presented at the Workshop. The papers will be published in Óptica Pura y Aplicada (OPA) the journal of the Optical Society of Spain. In addition, the HAVANATUR travel agency arranged almost all the participants' trips and jointly with the Hotel Tryp Cayo Coco offered discounts to the workshop participants and hosted the workshop.

Oral Presentations and Posters

A total 45 presentations took place, 26 as oral and 19 as posters presentations. An award committee selected the best student presentations in both, oral and poster sessions; each received an honored certificate. The individual evaluation of the members of the committee took place during the sessions. A joint session of the award committee decided to award the Best Oral Presentations to MSc



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Andrés Esteban Bedoya Velasquez (GLEO- Universidad Nacional de Colombia, Sede Medellín, Colombia), for the presentation “Saharan dust event over Colombia detected in the LALINET Lidar Observatory Atmosphere - LOA-UNAL”. The award for the Best Poster Presentations was awarded to Mauricio Munera (GLEO- Universidad Nacional de Colombia, Sede Medellín, Colombia) for his poster “Development Atmospheric Spectro-radiometry as a Support Technique to the LOA-UNAL Activities”. Two other posters were also recognized for their quality, in this order: Vania F. Andrioli (FISAT, INPE, Brazil) by the poster entitled: “Strong temperature gradients in the MLT region associated to an instability source” and Juan Carlos Antuña Sánchez (GOAC, Meteorological Center of Camagüey, INSMET, Cuba) for the poster “Design and construction of a Cloud Camera from a Raspberry Pi”.

The event

The event was divided in three parts:

1. *School on Lidar*

- April 6th, 2015 – Lidar Technique and Atmospheric Introduction for students at beginner level.
- April 7th, 2015 – Lidar Systems and Lidar signal processing for students at middle and advanced level.

2. *One-day external activities*

- April 8th, 2015 – Visit to the GOAC facilities in Camagüey and tour to Camagüey City historical part as a social activity,

3. *Workshop on Lidar Measurements in Latin America*

- April 9th-10th, 2015 – Oral and posters presentations on Lidar topics and remote sensing applications.
- April 10th, 2015 – Special Section on Aerosol long-range transport.

The School on Lidar

The invited professors and distribution of school courses were as follow:

1. – *Lidar Technique and Atmospheric Introduction for students at beginner level*

Lecture 1, Victoria Cachorro, Spain: Aerosols and Other Techniques for Aerosols Measurements.

Lecture 2, Paulo Artaxo, Brazil: Aerosol properties, including aerosol radiative forcing and aerosol-cloud interactions.



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Lecture 3, Juan Luis Guerrero, Spain: Lidar systems, as well as, algorithms and data exploitation.

2. – *Lidar Systems and Lidar signal processing for students at middle and advanced level.*

Lecture 4, Henrique Barbosa, Brazil: Algorithms and Data Exploitation.

Lecture 5, Adolfo Comerón, Spain: Lidars Networks, algorithms and protocols standardization.

Lecture 6, Elian Wolfram, Argentina: Ozone and water vapor lidars.

Lectures during the course and workshop were held at the Hotel Tryp Cayo Coco auditorium, Cayo Coco, Cuba, according the following program and schedule:

Time \ Day	06/04/15	07/04/15
	Monday	Tuesday
08:00 – 08:30	Registration And Opening	
08:30 – 10:40	Lecture 1	Lecture 4
10:40 – 11:00	<i>Coffee Break</i>	<i>Coffee Break</i>
11:00 – 12:40	Lecture 2	Lecture 5
12:40 – 14:00	<i>Lunch</i>	<i>Lunch</i>
14:00 – 15:40	Lecture 3	Lecture 6
15:40 – 16:00	<i>Coffee Break</i>	<i>Coffee Break</i>
16:00 –	Open Discussion	Open Discussion

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Workshop on Lidar Measurements

Oral presentations and posters sessions on Lidar topics and remote sensing applications were presented within following main topics:

Session 1:	Remote sensing application
Session 2:	Lidar applications in environmental sciences
Session 3:	Special Section on Aerosol long-range transport
Session 4:	Lidar Technologies and methods
Session 5:	Synergy between lidar and others instruments
Session 6:	Lidar Networking and Regional and international cooperation in lidar technologies



All presentations and posters were held at the auditorium of the Hotel Tryp Cayo Coco at Cayo Coco, Cuba, according to the following program:

Time \ Day	09/04/15	10/04/15
	Thursday	Friday
08:30 – 09:00	Invited Talk	Invited Talk
09:00 – 09:20	1 – 1	4 – 1
09:20 – 09:40	1 – 2	4 – 2
09:40 – 10:00	2 – 1	4 – 3
10:00 – 10:20	2 – 2	4 – 4
10:20 – 10:40	2 – 3	4 – 5
10:40 – 11:00	Coffee Break	Coffee Break
11:00 – 11:20	2 – 4	5 – 1
11:20 – 11:40	2 – 5	5 – 2
11:40 – 12:00	2 – 6	5 – 3
12:00 – 12:20	2 – 7	5 – 4
12:20 – 12:40	3 – 1	6 – 1
12:40 – 13:00	3 – 2	6 – 2
13:00 – 13:20	3 – 3	6 – 3
13:20 – 14:50	Lunch	Lunch
14:50 – 17:50	Poster Session P1 P2 P3 P4 P5 P6	Lalinet Forum Discussion
17:50 – 20:00	Social Activities	Social Activities

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One day of external activities

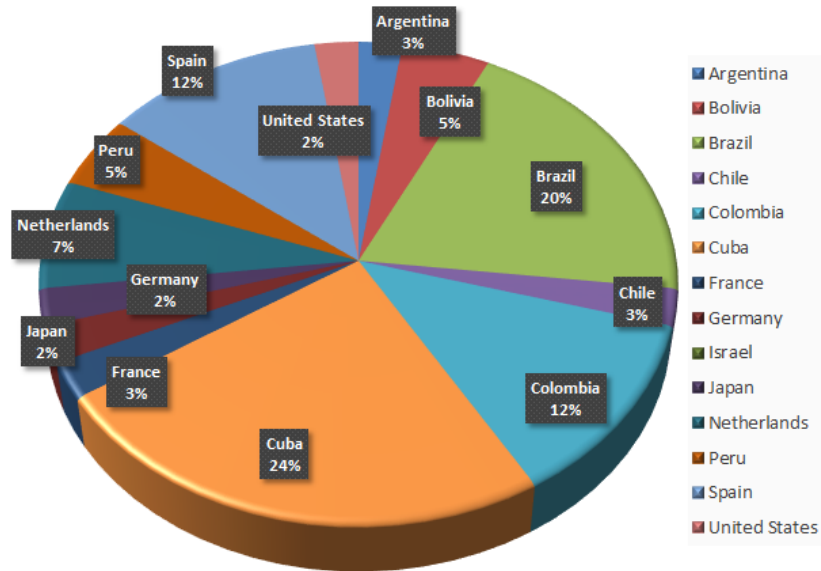
April 8, 2015 was the day for external activities. A visit to the Atmospheric Optics Group of Camagüey facilities in the Meteorological Center of Camagüey was conducted during the morning. After the visit, a lunch took place in the 1800 restaurant. In the final part of the day, a tour through Historical Center of Camaguey City was guided. This day was a break between the school and workshop; and an opportunity to keep together the students, young researchers and senior researchers.



Distribution of participants by country

Countries	Attendees	Presentations		Graduated Students
		Oral	Poster	
Argentina	1	2	1	
Bolivia	2	1	1	1
Brazil	8	8	3	4
Chile	1	1		
Colombia	5	2	1	4
Cuba	10	3	5	6
France	1	1		
Germany	1			
Israel			1	
Japan	1		1	
Netherlands	3	2		
Peru	2			
Spain	5	5	6	
United States	1	1		
Total	41	26	19	15

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LALINET executive meeting

On April 09th 2015, a LALINET executive meeting took place. In this meeting, some decisions were taken aiming a better way of communicating among the



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different LALINET leader stations and with the network coordination regarding the application of the measurement protocols and quality assurance procedures. In addition, some discussions were conducted regarding the future data analysis workshops in special the next one to be held in Medellin, Colombia, from 24th to 28th August.

The data analysis workshop will count with the participation of the Medellin Local team coordinated by Dr. Alvaro Bastidas and Dr. Henrique Barbosa (USP), Dr. Fabio Lopes (IPEN), MSc Maria Fernanda Sanchez (LIPAZ), Dr. René Estevan Arredondo (GOAC), the groups of Argentina and Chile will nominate their representatives. In order to proceed with the paperwork needed to support the workshop the Medellin Local team will count in the provision by each participant with the following documents until the end of May:

- Attendee Short CV
- Copy of Passport

The workshop objectives will be:

- Finalization of Klett Analysis to be used by all LALINET stations
- Definition of LICEL as a common data format
- Initialization of Raman data analysis package
- Discussion of NETCDF format for LIRIC, GARLLIC and GRASP future implementations

By a demand of a better communication flow between the network coordination with the LALINET station the delegates at this meeting have nominated two science officers who will help in implementing and supervising the measurement protocol, QA procedures, data distribution and observing this activity schedule compliance. The appointed SO's are:

- Dr. Eliam Wolfram
- Dr. René Estevan Arredondo

In order to better disseminate the network activities Dr. Ricardo Forno will help to implement a network blog.

Regarding the system settings and tests for quality assurance and handbook of instruments implementation it was agreed that the tests ZERO BIN and BIN

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SHIFT should be reapplied for those that have not implemented it yet or/and those system which have gone major configuration changes. TELECOVER and RAYLEIGH FIT and DARK CURRENT should run again until the end of July.

The group has decided as well to have by the end of July a "logfile" from each station telling which Monday's and Thursday's has each station been able to take measurements and in the case no measurement was carried on it should have a "flag" telling the reason such as rain, clouds, maintenance and so on.

LALINET discussion session

On Friday, April 10th, by the end of the VIII WLMLA, an open discussion session occurred where some points were highlighted and suggestions given:

1. To have all workshop reports published in the website,
2. To have all related papers in OPA and other publications, such as, SPIE, published on the LALINET website,
3. Update all LALINET member names,
4. To guarantee that in the next workshop the lectures and oral presentation to be in English, especially, in the case of courses for students,
5. The date for the next workshop, to be hosted in Colombia will be confirmed after ILRC, when the most suitable date to have the workshop will be selected,
6. A call for proposals will be lauched soon to decide when a MPLNET system will be installed,
7. ESA has given the opportunity a validation campaign should be carried on in South America. The station leaders should prepare a proposal to be sent to ESA tentatively by the end of this semester.

VII WLMLA Organizing committee

International committee

Dr. Eduardo Landulfo, (Chair)	IPEN, Brazil
Dr. Eduardo Quel	CEILAP, Argentina
Dr. Henrique Barbosa	U. de Sao Paulo, Brazil
Dr. Ricardo Forno	LFA-UMSA, Bolivia
Dr. Alvaro Bastidas	UNALMED, Colombia
Dr. Angel de Frutos	U. de Valladolid, Spain
Dr. Barclay Clemesha	INPE, Brazil
Dr. David N. Whiteman	GSFC-NASA, USA



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Dr. Georgios Tzeremes ESA-EU
Dr. Errico Armandillo ESA-EU (Consultant)
Dr. Elena Montilla CEFOP, Chile

Local Organizing Committee

Dr. René Estevan Arredondo GOAC, INSMET (Chair)
Dr. Boris Barja González GOAC, INSMET
Dr. Juan C. Antuña Marrero GOAC, INSMET
MSc. Albert Rodríguez Vega GOAC, INSMET
BSc. Frank García Parrado GOAC, INSMET
BSc. Jorge Rosas Santana GOAC, INSMET
BSc. Iralmys Y. Platero Morejón GOAC, INSMET
Eng. Nelson Díaz Spencer GOAC, INSMET
Eng. Juan C. Antuña Sánchez GOAC, INSMET

Financial and economic report

The administration of the funds was in charge of the conference chairs and the local organizing committee. The list of institutions that supported and sponsored the VIII WLMLA is:

Institution/Company	Amount	Destination
ESA	3000 €	Travel Grants/Logistic
WMO/GAW	7000 USD	Travel Grants/Logistic
IGBP/GLP	21023 BRL	Travel Grants
ICTP	3000 €	Travel Grants
OSA	4000 USD	Travel Grants
LICEL	2000 €	Travel Grants
RAYMETRICS	2000 €	Travel Grants

People Granted for the VIII WLMLA

A total of 28 students, young researchers and senior researchers were supported to attend to the VIII WLMLA. Three Brazilian students were granted directly by IGBP/GLP after the selection by the organizing committee.

NINE (9) FULL GRANTS = Air Tickets to Havana and return + Havana-Cayo
Coco-Havana Transfers + Hotels

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No	Name	Country	Sponsor
1.	Ricardo Forno	Bolivia	ICTP
2.	María F. Sánchez Barrero	Bolivia	OSA
3.	Diego Alves Gouveia	Brazil	IGBP/GLP
4.	Gregori de Arruda Moreira	Brazil	IGBP/GLP
5.	Pedro de A. Azevedo Santos	Brazil	IGBP/GLP
6.	Patricia Ferrini Rodrigues	Brazil	OSA
7.	Andrés E. Bedoya Velásquez	Colombia	ESA/ICTP
8.	Daniel J. Nisperuza Toledo	Colombia	ESA
9.	Victoria Cachorro Revilla	Spain	Raymetrics
10.	Boris Barja González	Cuba	ESA/WMO/GAW

NINE (9) LIVING EXPENSES = Havana-Cayo Coco-Havana Transfers + Hotel

No	Name	Country	Sponsor
1.	Michaël Sicard	Brazil	LICEL
2.	Juan L. Guerrero Rascado	Spain	LICEL
3.	Carmen Córdoba-Jabonero	Spain	LICEL
4.	Mauricio Múnera	Colombia	LICEL
5.	Eduardo Landulfo	Brazil	WMO/GAW
6.	Henrique Barbosa	Brazil	OSA
7.	Elian Wolfram	Argentina	ICTP/WMO/GAW
8.	Ricardo A. Yuli Posadas	Peru	ICTP
9.	Wilfredo Bulege Gutiérrez	Peru	WMO/GAW

TEN (10) LOCAL LIVING EXPENSES = Camagüey-Cayo Coco-Camagüey + Hotel

No	Name	Country	Sponsor
1.	René Estevan Arredondo	Cuba	WMO/GAW
2.	Juan C. Antuña Marrero	Cuba	WMO/GAW
3.	Albert Rodríguez Vega	Cuba	WMO/GAW
4.	Aldo Moya	Cuba	WMO/GAW
5.	Frank García Parrado	Cuba	WMO/GAW
6.	Iralmy Y. Platero Morejón	Cuba	WMO/GAW
7.	Jorge Rosas Santana	Cuba	WMO/GAW
8.	Juan C. Antuña Sánchez	Cuba	WMO/GAW
9.	Nelson Díaz Spencer	Cuba	WMO/GAW

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Attendees to the VIII WLMLA

No.	Name	Country
1	Elian Wolfram	Argentina
2	María F. Sánchez	Bolivia
3	Ricardo N. Forno Barrero	Bolivia
4	Diego Alves Gouveia	Brazil
5	Eduardo Landulfo	Brazil
6	Gregori de Arruda Moreira	Brazil
7	Henrique Barbosa	Brazil
8	Patricia Ferrini Rodrigues	Brazil
9	Paulo Artaxo	Brazil
10	Pedro A. de Azevedo Santos	Brazil
11	Vania F. Andrioli	Brazil
12	Rodrigo Fuentes	Chile
13	Amanda Anacona Anacona	Colombia
14	Andrés E. Bedoya Velásquez	Colombia
15	Daniel J. Nisperuza Toledo	Colombia
16	David E. Timaná Rodríguez	Colombia
17	Mauricio Munera Pérez	Colombia
18	Albert Rodríguez Vega	Cuba
19	Aldo Moya Álvarez	Cuba
20	Boris Barja González	Cuba
21	Frank García Parrado	Cuba

No.	Name	Country
22	Iralmy Y. Platero Morejón	Cuba
23	Jorge Rosas Santana	Cuba
24	Juan C. Antuña Marrero	Cuba
25	Juan C. Antuña Sánchez	Cuba
26	Nelson Díaz Spencer	Cuba
27	René Estevan Arredondo	Cuba
28	Sophie Godin-Beekmann	France
29	Riad Bourayou	Germany
30	Yoshitaka Jin	Japan
31	Errico Armandillo	Netherlands
32	Georgios Tzeremes	Netherlands
33	José Gavira Izquierdo	Netherlands
34	Ricardo A. Yuli Posadas	Peru
35	Wilfredo Bulege Gutiérrez	Peru
36	Adolfo Comerón	Spain
37	Carmen Córdoba-Jabonero	Spain
38	Juan L. Guerrero Rascado	Spain
39	Michaël Sicard	Spain
40	Victoria Cachorro Revilla	Spain
41	Patrick Hamill	USA



VIII WLMLA Group Photo

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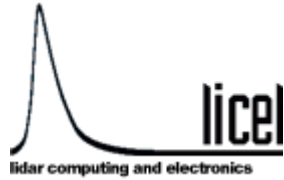


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Lidar Computing and Electronics



Atmospheric Optics Group – Valladolid University



European Space Agency



International Geosphere-Biosphere Programme



Global Land Project



World Meteorological Organization



Global Atmospheric Watch



The Optical Society



The Abdus Salam International Centre for Theoretical Physics



Raymetrics S.A.



Centre of Lasers and Applications



Institute of Energetics and Nuclear Researches



Atmospheric Optics Group of Camagüey



Meteorological Institute of Cuba

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Camagüey, May 8, 2015

