

VI Workshop on Lidar Measurements in Latin America Final Report. (La Paz, Bolivia - September, 26th –October, 1st, 2011)

The event

The VI Workshop on Lidar Measurements in Latin America (VI WLMLA), was held at La Paz, Bolivia, from September 26th to October 1st, as a result of a long preparation by the Local Organizing Committee led by the Atmospheric Physics Laboratory (LFA-UMSA) staff.

A new web site of the Atmospheric Physics Laboratory announced the event and informed about the organization: www.chacaltaya.edu.bo

The poster of the first announcement was as follows:

**VI Workshop on Lidar Measurements in Latin America
Training Course on Lidars**

September 26 to October 1, 2011
La Paz, Bolivia

Call for papers
Dead line : June 30 th.

Lidar technologies and methods.
Lidar applications in environmental sciences.
Lidar Networking.
Synergy between lidar and others instruments.
Regional and international cooperation in lidar technologies.

Atmospheric Physics Laboratory - IIF - UMSA <http://www.chacaltaya.edu.bo>

Abstract Submission	Call for Papers
<p>The Organizing Committee of the VI WLMLA would like to invite you to submit your scientific contribution to the meeting of lidar community of Latin America.</p> <p>The main topics that will be covered during the workshop are:</p> <ul style="list-style-type: none">• Lidar technologies and methods.• Lidar applications in environmental sciences.• Lidar Networking.• Synergy between lidar and others instruments.• Regional and international cooperation in lidar technologies. <p>In addition to the topics listed above, activity reports from the Latin American teams dedicated to the observation of the atmosphere with active and passive remote sensing instruments will be welcome. In this sense, participation on this Workshop is not restricted to teams using active lidars. On the contrary, the contribution from researchers and students working on Atmospheric Optics who intend to relate with existent research groups is of great interest for the objectives of this Workshop.</p> <p>The accepted papers will be published in the Workshop proceedings. A selection of these papers will be submitted to the journal Óptica Pura y Aplicada</p> <p>(http://www.sedoptica.es/main.html).</p>	<p>Please, write your abstract in up to 200 words, and do not forget to include the following items:</p> <ul style="list-style-type: none">• Title• Author(s) and affiliation• Keyword(s)• Specify if it will be an oral or poster presentation <p>Finally, send the Microsoft Word® .doc file, before June, 25th 2011, by e-mail to: marcos.f.andrade@gmail.com and lfa@umsa.bo. Notification of acceptance will be sent to the first author via e-mail before July, 15th 2009.</p> <p>Posters dimensions: 85 cm horizontal size and 105 cm vertical size. Talks duration: 20 m. Invited talks duration: 30 m</p> <p>Please, visit the workshop web site: www.chacaltaya.edu.bo</p>

The event was divided in three parts:

1. Training School on Lidars (26-28 September, 2011), devotes to students from Latin American Countries
2. The traditional workshop, with oral presentation and posters sessions. Lidar researchers and students from Latin America and the rest of the world attended the workshop,
3. A one-day tour to the lake Titicaca, as a social activity

The Training Course

The Course was held at the auditorium of the Institute of Ecology in the University Campus, Cota Cota, according the following program.

Monday 26		
10:00	P. Laj	Atmosphere: structure and properties
11:30	Coffee Break	
12:00	J. Antuña	Extinction, transmittance, scattering and absorption of light
13:00	Lunch	
14:30	J. Antuña	Introduction to the Lidar technique
15:00	J. Antuña	Types of Lidars
16:00	Coffee Break	
16:30	Visit to LFA	Visit to LFA
Tuesday 27		
09:00	P. Ristori	The Lidar equation (elastic/inelastic)
11:00	Coffee Break	
11:30	P. Ristori	Analytical solutions of the Lidar equation
13:00	Lunch	
15:00	P. Ristori	Analytical solutions of the Lidar equation
16:00	Coffee Break	
16:30	P. Laj	Optical properties of particles (microphysical view)
Wednesday 28		
09:00	P. Ristori	Lidars & aerosols
10:00	E. Wolfram	Differential absorption Lidar (DIAL) technique
11:00	Coffee Break	
11:30	D. Whiteman	Raman Lidar
13:00	Lunch	
14:30	D. Whiteman	Practical examples involving optical ray tracing
16:00	Coffee Break	
16:30	Course test	Course test

Participants and teachers:

The Latin America's attendees the Training Course were 52 from:

Argentina (3), Bolivia (31), Brazil (8), Colombia (3), Venezuela (1), México (1), Perú (1), Chile (1) and Cuba (3). Also a student from France participated in the Course.

All of them attended the Workshop too.

Representatives from ESA and NASA also participated in the workshop.

The course's teachers were researchers and professors, well known in the field of Lidars and Atmospheric Physics.

Argentina	E. Wolfram y P. Ristori
Cuba	J. Antuña
Francia	P. Laj
USA	D. Whiteman
España	V. Cachorro

The total number of participants, including teachers, was 59.

The opportunity of earning a certificate of proficiency was offered to students that will present in the next three months a monograph on subjects suggested by the course teachers.

Other activities

All the attendees had the opportunity to visit the LFA-UMSA facilities, particularly the new Lidar Laboratory, built thanks to the co-operation of ESA and NASA.

At the end of the Course a plenary session discussed about the evaluation of the school and possible improvements in the next workshop. All people agreed on the necessity of maintaining the training course in any future workshop, with the aim of interesting young students to the lidar field of research.

Then, existing Lidar groups exposed the state of art of their projects and introduced the members of their group attending the workshop.

New (or possible) Lidar groups in the region:

- Universidad de Concepción, Chile (beginning)
- Universidad de Puebla, Puebla, México (beginning)
- INPE, Brazil (operating)
- Universidad de Sao Paolo, Brazil (Operating in Manaus)
- Universidad de Pelotas, Brazil (just working with Calipso data but beginning a lidar project)
- Peru, (Looking for support to a Lidar project)
- Centro de Modelado Científico, Universidad de Zulia, Zulia, Venezuela (Interested in building on a Lidar group)

There was a general consensus about the excellent content and organization of the Training course and teachers and LOC was acknowledged by the participants.

Looking forward to the next training course, the following suggestions were done:

- To include practical exercises and project ideas at the end of the course.
- To separate the course in two levels: a basic one and an advanced one, devoted to postgraduate students.
- To explore the possibility of having on line courses) such as Webminar
- Dr. Elián Wolfram informed about courses in Argentina
- Dr. Paolo Laj informed about ERCA courses in France.

The workshop

The formal two-day workshop sessions took place at ENTEL auditorium, downtown La Paz, near the UMSA central building, according to the following final program

VI Workshop on Lidar Measurements in Latin America program

September 29	09:00	09:30	Registration	
	09:30	10:00	Inauguration	
	10:00	10:20	Pablo Ristori	The Puyehue-Cordón Caulle Volcanic Eruption
	10:20	10:40	Michaël Sicard	Coordinated measurements of the eruption of the Eyjafjalla volcano by five spalinnet lidar stations
	10:40	11:00	Paolo Laj	Aerosol research at the Himalayas
	11:00	11:30	Coffee break	
	11:30	11:50	Diego Lange	Optimised data-gluing method for mixed analog/photon-counting lidar signals
	11:50	12:10	Patrick Hamill	Using Spaceborne Lidar to Identify Tropospheric Aerosols
	12:10	12:30	Victoria Cachorro	In situ measurements of aerosols microphysical properties in a subarctic region
	13:00	14:45	Lunch	
	14:50	15:20	David Whiteman	What good is Raman water vapor lidar?
	15:20	15:40	Georgios Tzeremes	Latest developments for EarthCARE High Spectral Resolution Lidar
	15:40	16:00	Gerhard Held	Raman Lidar monitors emissions from sugar cane fires in the State of São Paulo: A Pilot-Project integrating Radar, Sodar, Aerosol and Gas observations
	16:00	16:20	Elian Wolfram	Systematic Ozone and Solar UV Measurements in the Observatorio Atmosférico de la Patagonia Austral, Argentina
16:20	16:50	Coffee break		
16:50	17:50	Poster session	Posters	
18:00	19:00	Guitar recital by Pirai Vaca		
19:00	20:00	Cocktail by the President of our University		
September 30	08:30	08:50	Alvaro Bastidas	Remote sensing of tropical aerosols at Medellín, Synergism NASA-AERONET - Colombia
	08:50	09:10	Elena Montilla	Remote Sensing activities at Center for Optics and Photonics, Chile
	09:10	09:30	Renata da Costa	Some results on scanning of industrial atmospheric emissions using Lidar technique
	09:30	09:50	Henrique Barbosa	Continuous Measurements of Aerosols and Water Vapor in the Amazon
	09:50	10:10	Pablo Ristori	Biomass burning and volcanic ash characterization at CEILAP, Buenos Aires, Argentina
	10:10	10:30	Mariano Glauber	Southern Brazil: analysis of aerosols from different sources through the sensors MODIS and CALIOP
	10:30	11:00	Coffee break	
	11:00	11:20	Errico Armandillo	ESA Lidar Programs: Missions and Critical Qualification Development Effort
	11:20	11:40	Marcos Andrade	Aerosols transport over the Andes: The new GAW station
	11:40	12:10	Fabio Lopes	Lidar activities in Sao Paulo - Brazil
	12:10	12:30	Boris Barja	One year of cloud optical depth measurements with sunphotometer in Camaguey Cuba
	13:00	14:45	Lunch	
	14:50	15:10	Martin Cadirola	Web-based, next-generation data collaboration for Lidar communities
	15:10	16:20	ALINE	ALINE
16:20	16:50	Coffee break	Coffe break	
16:50	17:50	Poster Session	Posters	

Oral Presentations and Posters:

A total of 36 presentations took place, 21 of them oral and 15 as posters, divided in 4 sessions. The coffee breaks and the last hour of every session were devoted to the poster presentation and discussion.

The distribution of the 21 talks per country was as follows:

Argentina:	4
Brazil	4
France	2
USA	2
Cuba	1
Italy	1
Greece	1
Colombia	1
Chile	1
Austria	1
Spain	1
Bolivia	2

Participants:

The VI WLMLA was attended by 62 participants, 52 of them (84%) from Latin America; 31 of the attendees were students (50%). Three countries participated for the first time: Venezuela, Mexico and Austria.

Country	Attendees	Speakers	Students
Bolivia	26	2	19
Brazil	8	4	5
Argentina	5	4	1
Cuba	4	1	1
Colombia	3	1	2
France	3	2	0
USA	3	2	0
Chile	2	1	1
Spain	1	1	0
Italy	1	1	0
Peru	1		1
Greece	1	1	0
Austria	1	1	0
Mexico	1		0
Israel	1		0
Venezuela	1		1
Total	62	21	31

Discussion Session

As in the previous workshops the Discussion Session on ALINE network showed itself to be an important component of the workshop.

Conducted by Dr. Juan Carlos Antuña jointly with Dr. Francesco Zaratti, the main topics discussed were:

1. The structure of future workshops.
 2. Capacity Building and international cooperation
 3. Publication of Papers in the journal *Optica Pura y Aplicada*
 4. VII WLMLA (2013)
- Discussion about the length of the training course and the workshop: some people say that two day workshop is not sufficient and other argue that 3 days training course and two days workshop is well balanced option.
 - Training course: some student says that would be interesting to explore the realization of two simultaneous training courses one of basic and the other of intermediate level. Brazilian PhD students offer their help to assist the next course organizer with the basic level course.
 - Poster session: as in past workshops of our community, some people say that the poster session is not well used (or presented), especially concerning with one of the main goals of our meetings that is to bring student participation and interest. For that reason, other

people suggest to give short oral presentations (a couple of minutes) of the posters as ice breaking of each poster session. Other participants propose the use of free media sources, like *youtube* to show the poster session with short videos.

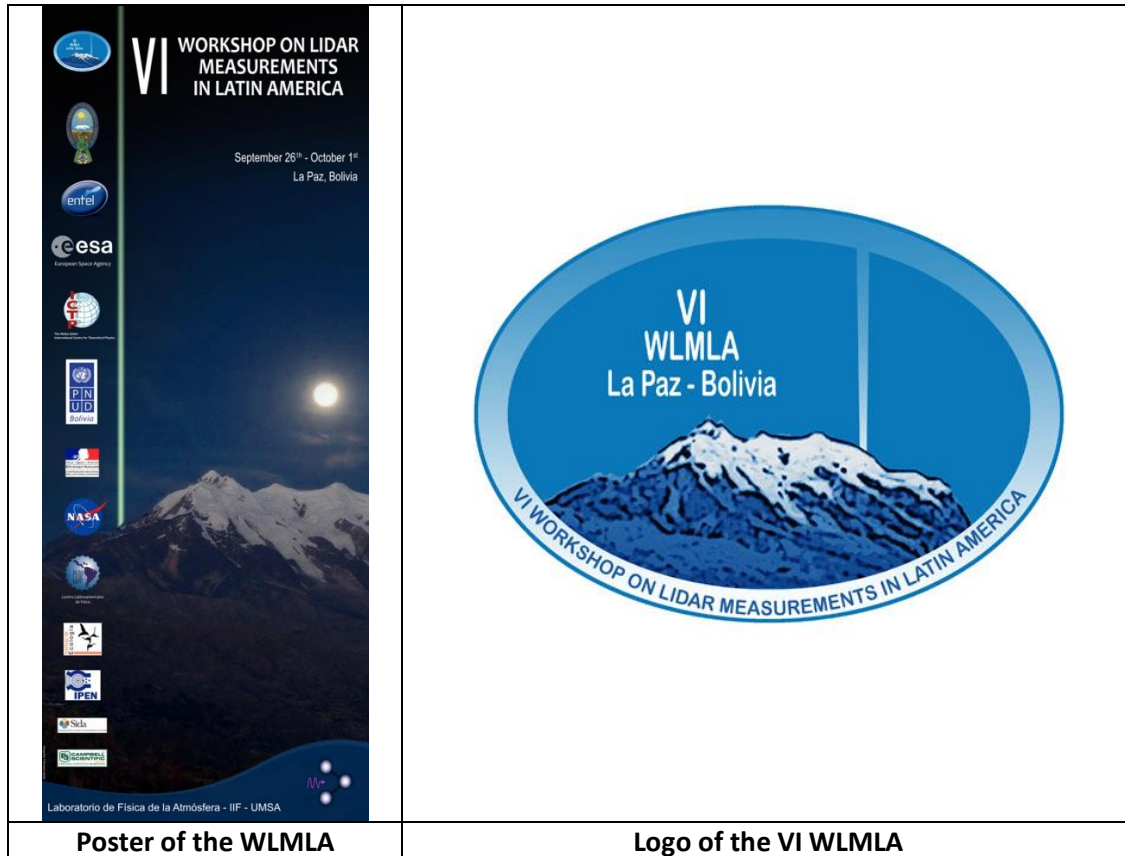
- Share info: some students want that the information or publication that any lidar group produces will be posted on the WLMLA website or linked to each group webpage.
- Late discussion was held about necessity to share one unique inversion algorithm (for aerosols) and also to share code of lidar signal processing and filtering tools. Some words were expressed about the possibility to built some standard instrument for intercomparison among different sites.
- About common activities:
 - Upload information on a common blog related to interesting atmospheric event to monitor.
 - Enrique Barbosa (Brazil) proposes to make a common observation of biomass burning during August-September (dates need to be fixed) as first step of common activities. All Lidar groups interested in this activity and affected by it can participate.
 - About the development of a new web page: Enrique Barbosa offers a server at San Paulo University to host material to be shared, or future web page.
 - Martín Cadirola proposes the registration of new web site, like www.latinlidar.org;
 - Francesco Zaratti comments about the necessity of a common project of radiometer and other instruments calibration and intercalibration in South America.
- **Regarding extended abstracts and paper publication**, the following deadline were proposed:
 - October 30th: Deadline for submission of extended abstracts to be published on a special issue of the Revista Boliviana de Fisica,
 - December 15th: Deadline for Submission of the papers to OPA
- By general consensus, **next workshop of WLMLA will be held in Concepción, Chile, in 2013.**

At the end of the last session, several attendees acknowledged the quality of the organization of the workshop. A general consensus was to praise the LOC and in particular Dr. Francesco Zaratti and his staff for the excellent work they have done for organizing the workshop and making it successful.

Graphic material of the workshop

Posters, banners and a logo of VI WLMLA were designed by the LOC.

A Multimedia of the entire event, created by *Nova Interactiva*, was given to the participants in an elegant pendrive at the end of the event. The same Multimedia is available at this web site: www.novainteractiva.com/vilidar/VI-LIDAR.rar



Poster of the WLMLA

Logo of the VI WLMLA

Financial and economical report

The administration of the funds was in charge of a Foundation linked to the Institute of Ecology of UMSA: Fundacion para el Desarrollo de la Ecologia (FUND-ECO).

The list of institutions that sponsored the VI WLMLA is:

<i>NAME</i>	<i>Amount of contribution (US\$)</i>
European Space Agency (ESA)	6,400.00
International Centre for Theoretical Physics (ICTP)	5,700.00
Latin American Center of Physics (CLAF)	1,500.00
SIDA/UMSA program for scientific research	4,000.00
United Nations Development Program (UNDP)	5,000.00
<i>Other institutions supported directly the event</i>	<i>with:</i>

French Cooperation, Lima, Peru	air tickets (3)
NASA	air tickets (3)
Campbell Scientific	air tickets (3)
Brazilian Institute for Nuclear Research (IPEN)	air tickets (2)
ENTEL	Workshop auditorium
Optical Society of Spain	Papers Publication

People granted by LOC

A total of 20 students and young researchers from L.A. countries were supported by LOC and Bolivian students were supported with lunches. As mentioned, 12 air tickets were granted directly by other supporters. See list of granted people in Annex 2.

There were three types of grants by LOC, with the following amounts:

7 Full grants: air tickets and living expenses	\$ 9,000
5 Air ticket only	\$ 2,500
9 Half grants: living expenses	\$ 4,500

Other expenses such as social activities (\$3,500), the Multimedia of the event (\$1,000) and publication and administration costs will complete the balance of VI WLMLA.

Social activities

Some social activities were organized during the workshop: an exclusive guitar concert by the most famous Bolivian artist, Piraí Vaca, held at the auditorium of the workshop; a cocktail offered by the President of the University, Teresa Rescala, and a one-day tour to the Lake Titicaca.



Participants to the VI WLMLA visiting a floating island at Lake Titicaca

Organizing Committees

- ***Local Organizing Committee (LOC):***

Francesco Zaratti (Chair), Ricardo N. Forno (Co-chair),
Marcos F. Andrade, Luis A. Blacutt, René Gutiérrez, Wilfredo Tavera, Fernando Calderón,
Fernando Velarde, Fabricio Avila, , Juan Calle, Leslie Fanola, Decker Guzman, Oscar Lazcano,
Valeria Mardoñez, Marcelo Peñalosa, Manuel Roca, Marcelo Vargas, Peter Zabala, Cristian
Conitzer, David Whiteman (GSFC-NASA, USA)

- ***International Organizing Committee (IOC):***

Eduardo Landulfo (Chair)	IPEN, Brazil
Francesco Zaratti (Co-Chair)	LFA-UMSA, Bolivia
Juan Carlos Antuña	GOAC, Cuba
Errico Armandillo	ESA-EU
Barclay Clemesha	INPE, Brazil
Angel de Frutos	U. de Valladolid, España
Gelsomina Pappalardo	IMAA, Italia
Alan Robock	Rudgers University, USA
Eduardo Quel	CEILAP, Argentina
Alvaro Bastidas	UNALMED, Colombia
Upendra Singh	LaRC-NASA, USA
David N. Whiteman	GSFC-NASA, USA

More details, about the workshop, pictures of both events and relevant documents will be found in the attached Multimedia of the VI WLMLA.

La Paz, October 31st, 2011

ANNEX 1

LIST OF ATTENDEES, COUNTRY, E-MAIL

A. Attached file: List of participants_course.pdf

B. Attached file: List of participants_workshop.pdf

ANNEX 2

LIST OF GRANTED PEOPLE by LOC's FUNDS		
NAME	country	Type of grant
Glauber, Mariano	Brazil	air ticket
Moreira, Rena' (Mr.)	Brazil	air ticket
Orte, Pablo F.	Argentina	air ticket
Pawelko, Ezequiel	Argentina	air ticket
Salvador, Jacobo	Argentina	air ticket
Antuña, Juan Carlos	Cuba	full grant
Barja, Boris	Cuba	full grant
Estevan, Rene	Cuba	full grant
Hernandez, Carlos	Cuba	full grant
Nisperuza, Daniel	Colombia	full grant
Nuñez Ramirez, Alfredo	Venezuela	full grant
Wolfram, Elian	Argentina	full grant
Bastidas, Alvaro	Colombia	living expenses
Bedoya, Andres	Colombia	living expenses
Da Costa, Renata	Brazil	living expenses
Elena Montilla	Chile	living expenses
Ferrini, Patricia	Brazil	living expenses
Larroza, Eliane	Brazil	living expenses
Lopes, Fabio	Brazil	living expenses
Nakaema, Walter	Brazil	living expenses
Yokota, Daniel	Peru	living expenses

<i>Granted by other supporters that informed to LOC</i>		
Bastidas, Alvaro	Colombia	air ticket
Bedoya Andres	Colombia	air ticket
Yokota, Daniel	Peru	air ticket
Garcia, Veronica (She did'n attend)	Ecuador	air ticket
Larroza, Eliane	Brazil	air ticket
Lopes, Fabio	Brazil	air ticket
Ferrini, Patricia	Brazil	air ticket
Da Costa, Renata	Brazil	air ticket
Nakaema, Walter	Brazil	air ticket
Ristori, Pablo	Argentina	full grant
Silva, Antonieta	Chile	full grant

Annex 3:

Photos group: The course



Photo Group: The workshop



ANNEX 4: Certificate models

