LALINET EARTHCARE CAL/VAL

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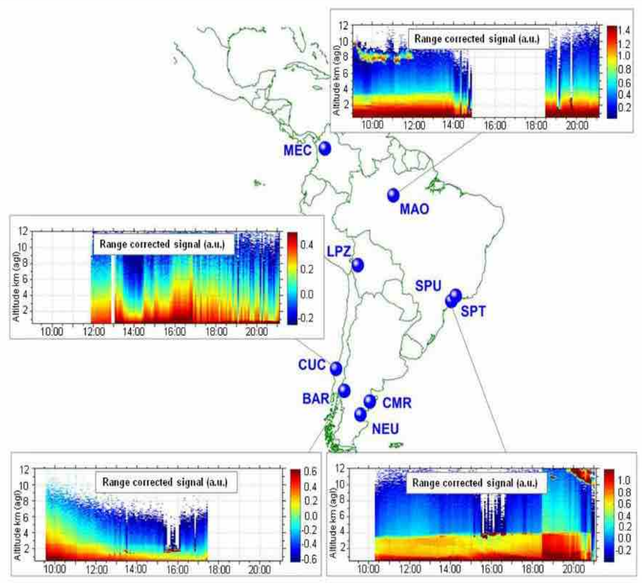
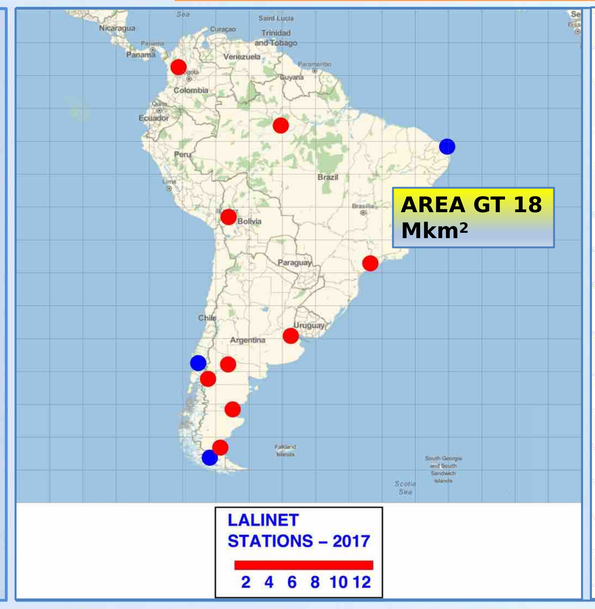
LALINET INTRODUCTION



LALINET's OPERATIONAL DRIVES

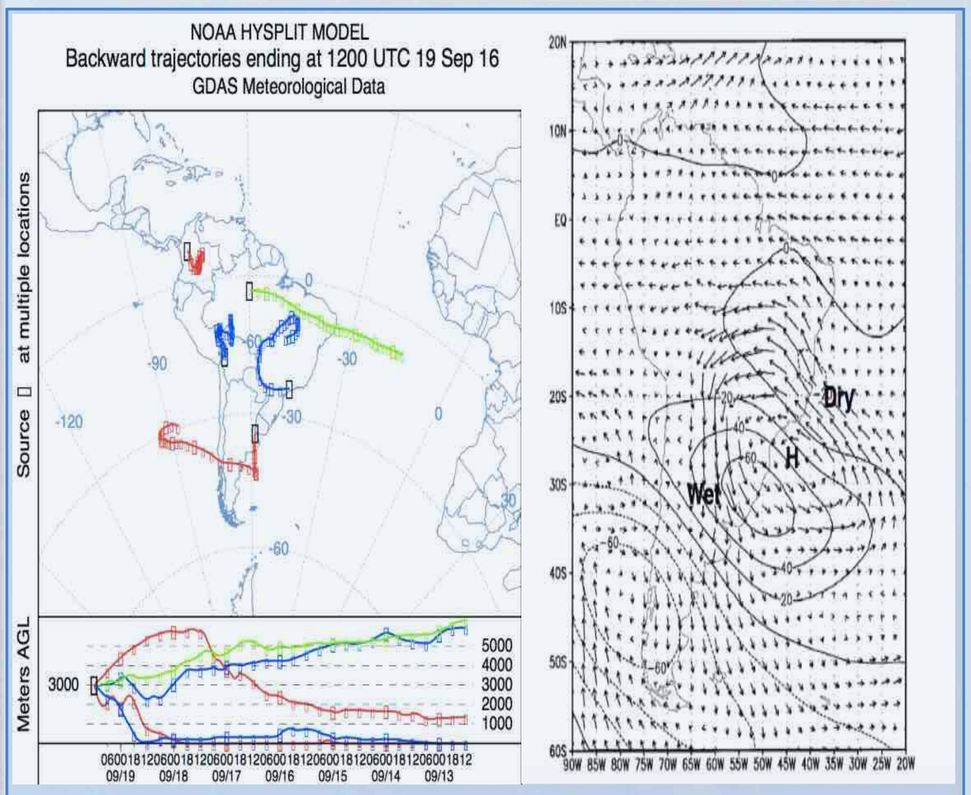
- **Perform** measurements and data acquisition following established protocols
- **Maintain** a QA/QC routine among all participating stations
- **Apply** an unified data analysis routine common to all stations, e.g., Single Calculus Chain
- **Create** a scientifically significant distributed database, e.g., lidar ratio, particle extinction, backscatter, angstrom exponents and particle depol. regional values
- **Guarantee** the continuity of LALINET's biannual workshops by the intensification of its role as a mechanism of transfer of knowledge, evaluation of joint actions conducted and agreements on how to continue under the new evolving situations. In 2018 second semester, the host site should be in Medellin, Colombia
- **Search** inter-network exchange, ACTRIS 1 and ACTRIS 2, SAVERNET

LALINET STATIONS



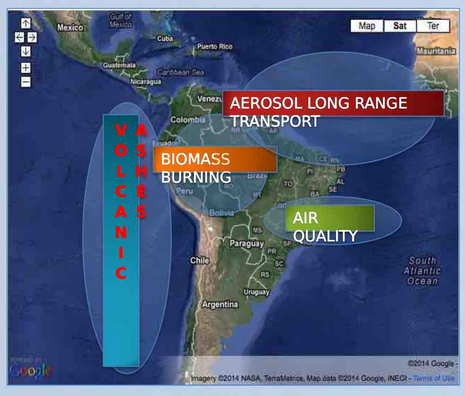
ST.	ID	LAT(S) LON(W)	Channels (nm)
Buenos Aires	AEP	34.56°S 58.42°W	1064, 532P & 355P
Buenos Aires	VMA	34.56°S 58.51°W	1064, 607, 532P, 387 & 355P
Neuquen	NQN	38.95°S 68.13°W	1064, 532P & 355P
Bariloche	BRC	41.15°S 71.16°W	1064, 607, 532, 387 & 355
Commodoro	CDR	45.79°S 67.46°W	1064, 532 & 355
Galegos	RGL	51.61°S 69.31°W	1064, 532P & 355P
Punta Arenas	PAR*	53.13°S 70.88°W	1064, 607, 532P, 408, 387 & 355P
S. Paulo	SPU	23°13' 46°28'	1064, 607, 532, 408, 387 & 355
S. Paulo	SPT	VAR	607, 532
Manaus	MAO	02.60°S 60.21°W	408, 387, 355
Natal	NAT	05.82°S 35.20°W	1064, 532P & 355P
Temuco*	TMU*	38.74°S 72.62°W	1064, 532P & 355P
Medellin	MED	06.26°N 75.58°W	532 & 355
La Paz	LPZ	16.54°S 68.07°W	1064, 532P & 355P

SOUTH AMERICAN AIR CIRCULATION

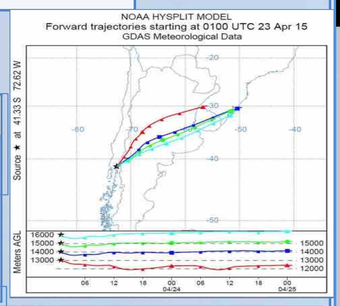


200 hPa height difference and 850 hPa winds during austral summer.

NETWORK SCIENTIFIC DRIVES

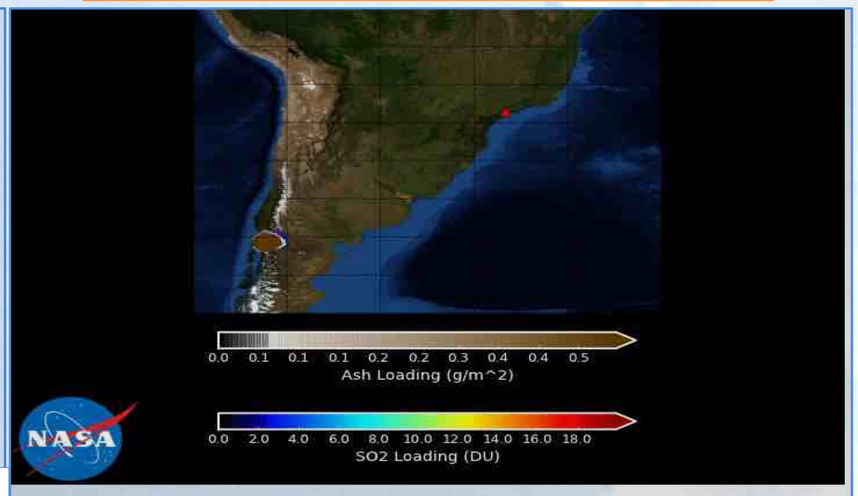


VOLCANIC ASHES & PLUMES



- 22nd – 23rd of April, 2015-Calbuco volcano began eruption
- First eruption since 1972
- Ash cloud achieved above 15 km of altitude

VOLCANIC ASHES & PLUMES



Model Grid Resolution: .5º x .5º
Plume Top: 18km - *Based on CALIPSO Obs.*
Plume Thickness: down to 8km *Based on satellite obs.*
Ash Emission Rate: 5x10⁴ Kg/s
SO_2 Emission Total: 300 Kt. *Based on satellite obs.*
Timing: Two Eruption Pulses
(1) 04/22 21:38Z – 23:38Z
(2) 04/23 04:38Z – 10:08Z
Based on GOES IR and Reports
Simulation run with GOES-5 Replay Meteorology (not forecast)

APEL goal

- Building a bridge between EARLINET and LALINET

Scientific cooperation

Joint publications	Harmonization of SoPs
Joint studies	Harmonization of data collection procedures
Joint campaigns	Harmonization of data evaluation procedures

Operational capacity

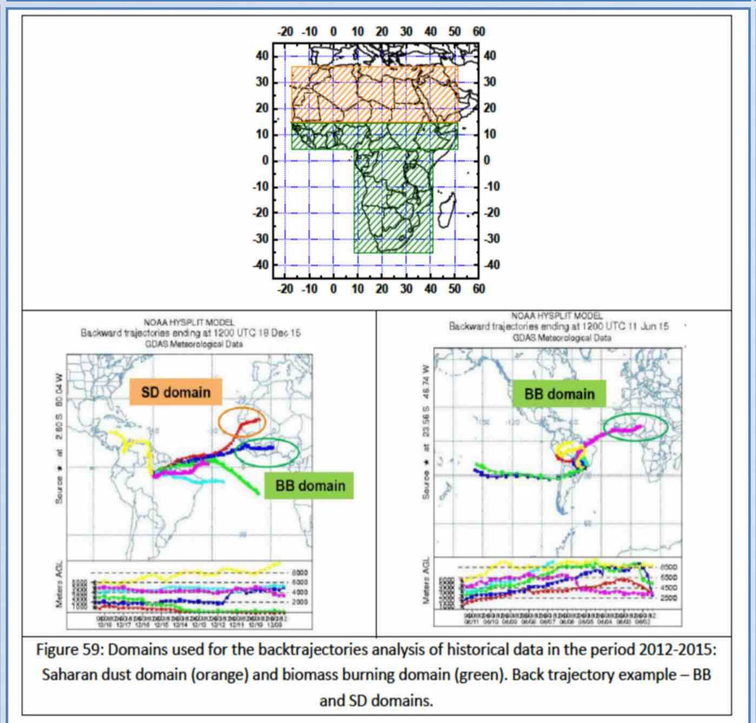


Figure 59: Domains used for the backtrajectories analysis of historical data in the period 2012-2015: Saharan dust domain (orange) and biomass burning domain (green). Back trajectory example – BB and SD domains.

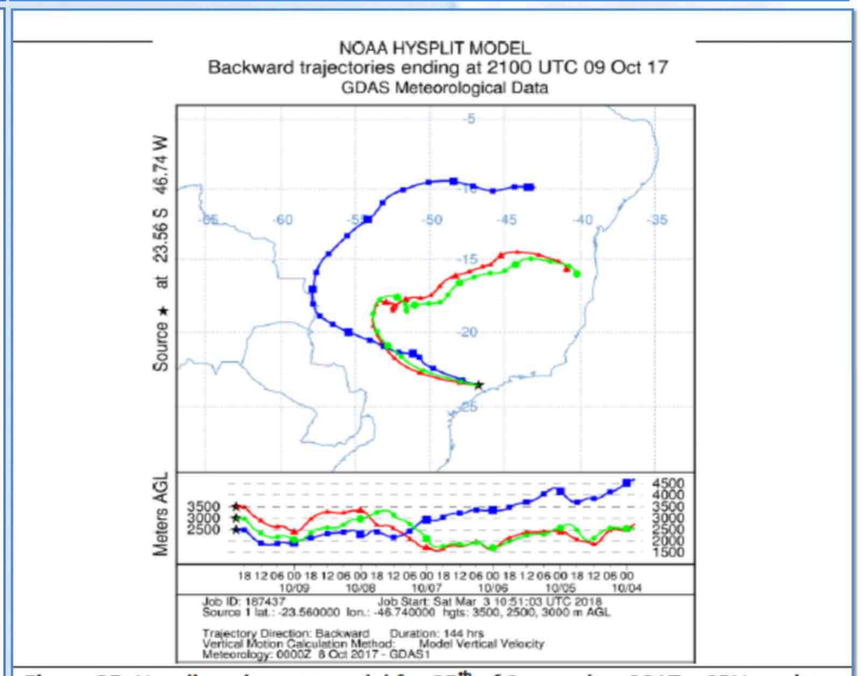
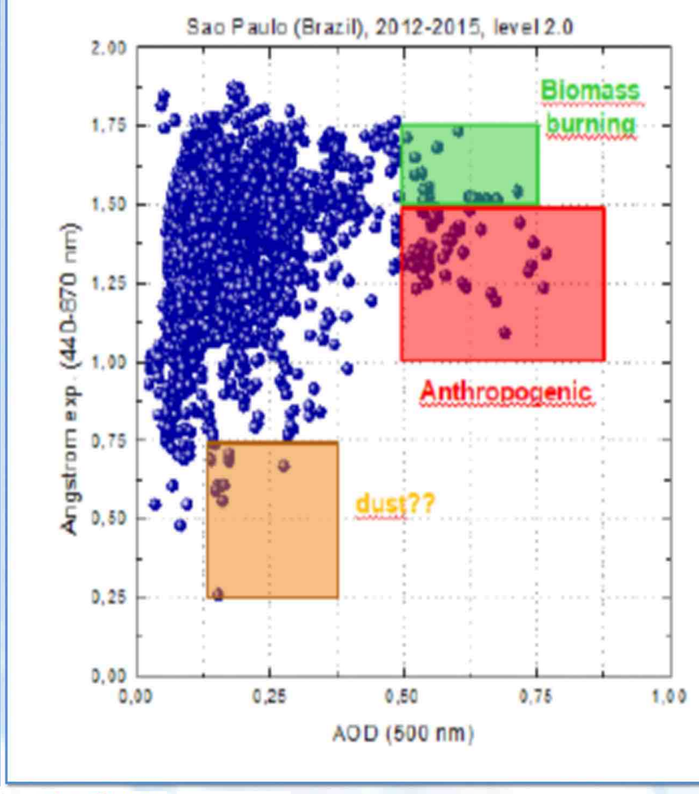


Figure 35: Hysplit trajectory model for 25th of September 2017 – SPU station

	Lidar specifications	Measured parameters	Application
SPU	Emission: 1064, 532, 355nm Detection: 1064, 607, 532, 408, 387, 355nm Range: 1- 15 km	- backscatter coefficient at 355, 532, 1064nm - extinction coefficient at 387 and 607nm - derived optical parameters: lidar ratio, extinction derived Angstrom, color ratio - water vapor mixing ratio	- aerosol layering and dynamics - typing based on backtrajectories and sun photometer - advanced aerosol typing: NATALI (low res) - long range transport studies (backtrajectories and sun-photometer)
MAO	Emission: 355nm Detection: 408, 387, 355nm Range: 0.7 – 15 km	- backscatter coefficient at 355nm - extinction coefficient at 387nm - derived optical parameters: lidar ratio - water vapor mixing ratio	- aerosol layering and dynamics - typing based on backtrajectories and sun photometer
NAT	Emission: 1064, 532, 355nm Detection: 1064, 532p, 532c, 355 nm Range: 1 - 15 km	- backscatter coefficient at 355, 532, 1064nm - volume and particle linear depolarization ratio - derived optical parameters: color ratio	- aerosol layering and dynamics - typing based on backtrajectories, depolarization parameters and sun



- **Implementation of the EARLINET DA/DC program at LALINET stations**
- →Evaluation of the current observation capabilities in South America, by comparison with EARLINET standards and procedures.
- **Observation of aerosol characteristics at selected LALINET stations**
- → Apel campaiing + Data Analysis

esa

APEL

Assessment of atmospheric optical Properties during biomass burning Events and Long-range transport of desert dust

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- *Fábio Lopes, IPEN*
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- *Anderson Guedes, NAT*
- *Marcos Paulo Araújo, NAT*

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7th international earthcare science workshop & 1st esa earthcare validation workshop
11 - 15 June 2018 | Bonn | Germany