



ICOS Atmospheric MSA **ATC update inc. metadat** *Nov 13, 2012, Paris*



ATC contacts



Lynn Hazan
• ICOS ATC Database



Jerome Tarniewicz
• Data extraction, distribution,
products



Olivier Laurent
• Test lab, Training,
network



Tuomas Laurila
• ATC finnish hub



Michel Ramonet
• Scientific coordination



Cecilia Garrec
• ATC admin manager



Leonard Rivier
• ATC manager

- q + 4 short term contract in LSCE
- q + 2 permanent positions in Helsinki
- q Permanent position: Metrology
scientist open call now

Extended ICOS Atm demo experiment

The Demo Experiment

- Atmospheric Thematic Center
- The Demo Atmospheric Network
- Data Products

Data Restricted Access

- Demo exp data
- MACC-II

CO₂ & CH₄ simulations

Agenda

No upcoming events

The Demo Atmospheric Network



- Central data processing
- Automated internal data product
- Flagging ATCqc



New dedicated Laboratory at LSCE , 2 kinds of activities:

- Initial Icos Instrument Test (I³T) : determine the instrument performance at t0 of their ICOS Life time. Include Instrument system and configuration backup.
- Technological Watch Lab (TWL): test new instruments.

2 reference instruments (Picarro ESP1000 and Picarro G2401).

In situ measurement comparison with FTIR (Ecotech) and GC available.

A **new** bench for water vapor correction assessment (cf. O. Laurent) : test in progress.



Instruments tested:

- I³T activity: 17 instruments in total
 - Picarro G1301: 1
 - Picarro G2301: 5
 - Picarro G2401: 6 (+2 in Dec)
 - LGR CO/N₂O: 3 (including 2 EP version)
- TWL activity:
 - Environnement SA CO/CO₂
 - Aerodyne CO/N₂O : test in progress
 - Picarro G2201-i (Co₂ and Ch₄ isotopes): test in progress



- Main focus on data processing tool esp flagging tool, included a instrument setup session
- Both lecture and hands on practical work
- Very positive feedback, all would recommend the training.
- Main limitations: duration was too short, different expertise level in the group

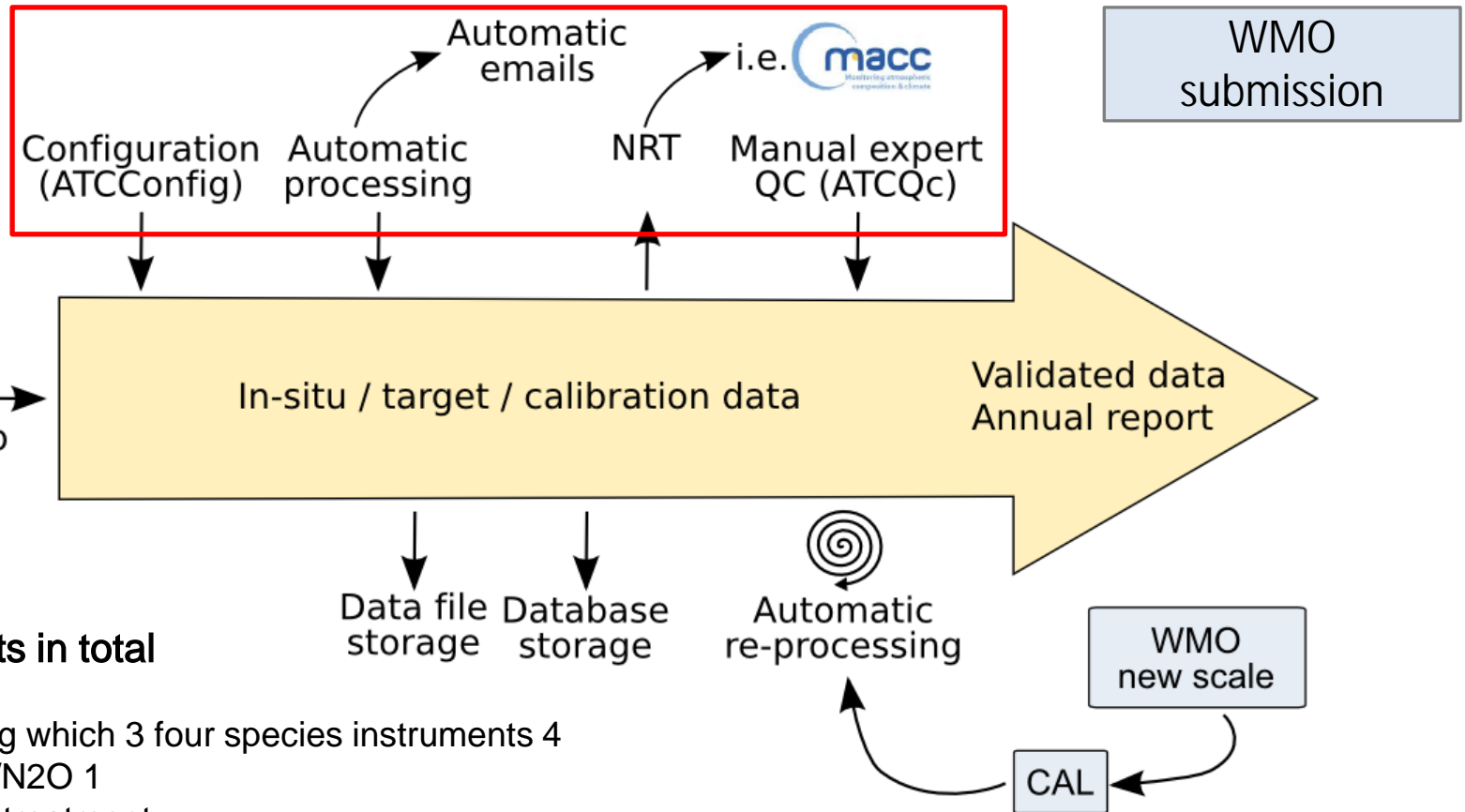
Agenda of the 1st ATC Training
October 1st - 3rd 2013, 9h-18h, 18h-21h

	Thursday 1 st Oct.	Friday 2 nd Oct.
09:00-10:30	Welcome - Introduction (J. Bollen) Activities Self-introduction Lecture <ul style="list-style-type: none"> Data flow (J. Hagen) Hardware (optional and explanatory) (J. Hagen) Diagnostic data (J. Hagen) ATC Configuration for a station (J. Hagen) 	Practical Work <ul style="list-style-type: none"> Data Flagging (continuation) (M. Rammert) Data extraction (J. Laurent)
10:30-11:00	Coffee Break	Coffee Break
11:00-12:30	Practical Work <ul style="list-style-type: none"> ATCConfig application (J. Laurent) Automatic file transfer (ICOS_Station) (J. Laurent) 	Software Instrumentation (gas analysis) and integration setup (J. Laurent)
12:30-13:00	Lunch (sponsored)	Lunch (sponsored)
13:00-15:00	Lecture <ul style="list-style-type: none"> Data Processing (calibration, water correction, filtering, auto-flagging) (J. Laurent) Data Products (J. Tilmann) 	Practical Work (J. Laurent, M. Rammert) <ul style="list-style-type: none"> Instrument maintenance, Instrument troubleshooting Good Practice (Pump, Swagelok...) Open slot for further request
15:00-16:00	Coffee Break	Debriefing - End of the training
16:00-18:00	Practical Work <ul style="list-style-type: none"> Presentation of the ATC application (M. Rammert) Data Flagging (M. Rammert) 	
18:00-21:00	Dinner (sponsored)	

Training location: IZL, CSA - Office des Stations, 67 rue de la Paix, Strasbourg



Operational CO₂/CH₄/CO data processing with quality control



43 instruments in total

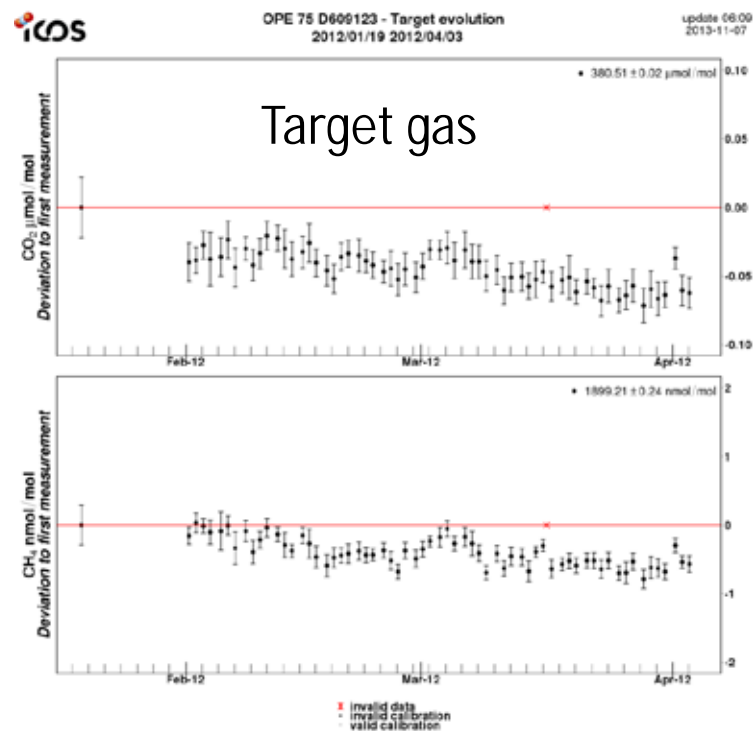
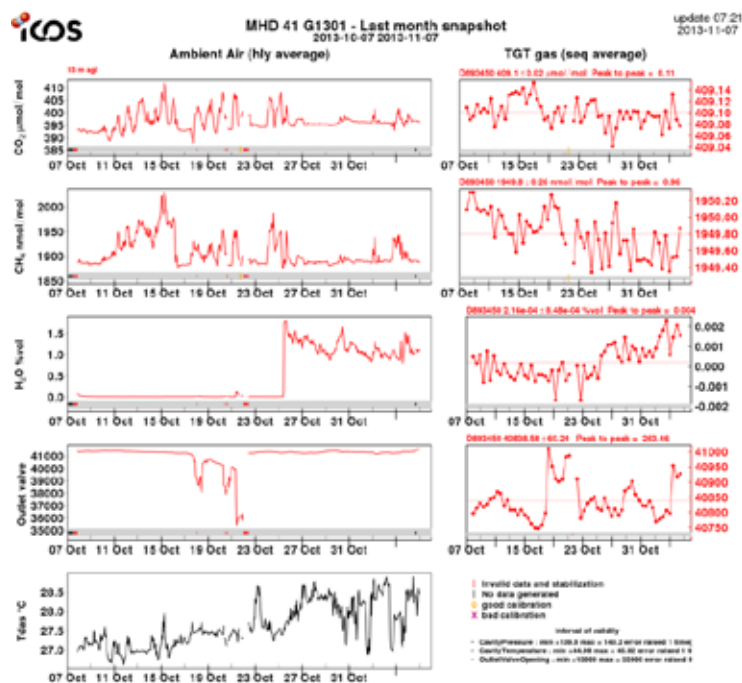
- 17 Picarro among which 3 four species instruments 4
- 1 Los Gatos CO/N₂O 1
- 1 Radon gaz full treatment
- 1 Radon gaz black box
- 3 radon "Heidelberg" en boîte noire
- 15 "station" meteo
- 2 Lidar black box
- 3 diagnostic data instruments

Facts & figures on ICOS data products

Ø *Each day:*

- § 950 data products,
- § distributed into 42 types of products in 11 categories,
- § for 17 stations,

automated process on new ICOS dedicated servers













ATC website frequentation and usage

Nov 2012-nov. 2013 is:

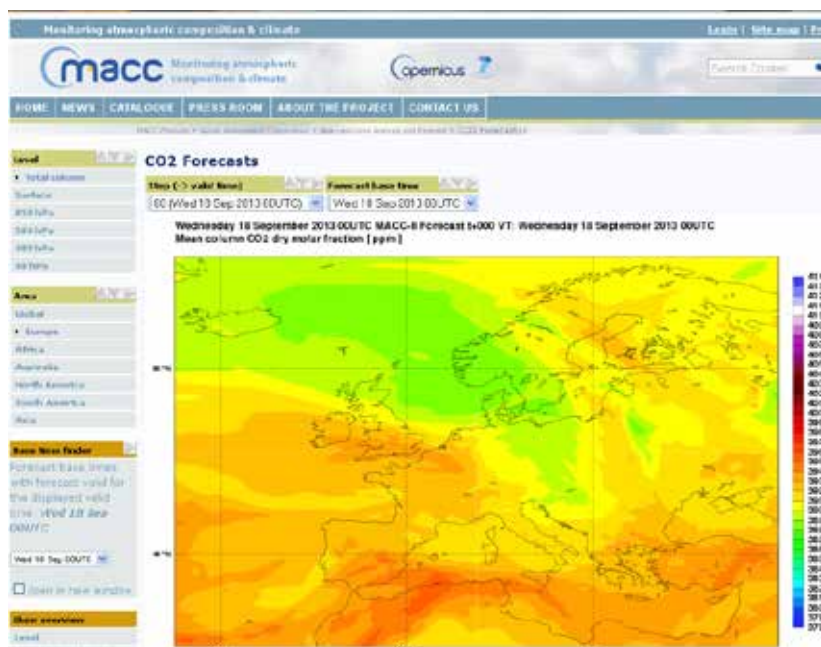
- § >12000 pageviews,
- § >1100 unique visitors, with a 62% of returning visitor
- § 4min38 average visit duration,
- § Over last 6 months X4 volume of data downloaded by user

Map overlay is summary of visits by country (France excluded)

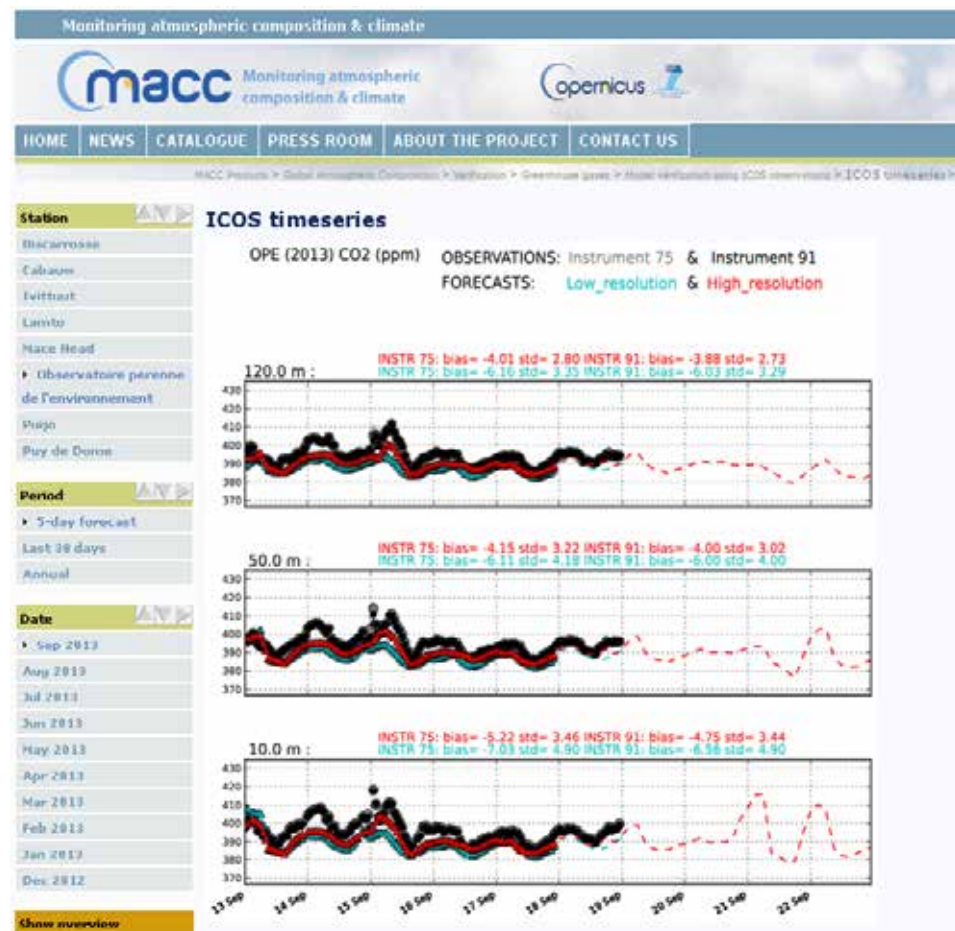
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1.	 France	60.21%
2.	 United Kingdom	5.71%
3.	 Finland	3.76%
4.	 Ireland	3.18%
5.	 Germany	3.15%
6.	 Netherlands	3.11%
7.	 United States	2.53%
8.	 Italy	2.36%
9.	 Turkey	1.64%
10.	 Czech Republic	1.26%

2013 Highlight: CO₂ forecast through MACC



NRT data provision for MACC-2: 5-day forecast since December 2012



- § Bergamaschi et al.: Report on the quality of the inverted CH₄ fluxes, D-043.3 WP43(GHG: Flux inversion), 2013
- § Agusti-Panareda et al.: A new real-time atmospheric CO₂ forecast product, poster at ICDC9, Beijing, China, 2013
- § Massart et al.: Quality of the analysed CO₂ 4D fields from the MACC-II delayed mode system, D-042.06 WP42 (GHG), 2012
- § Berchet et al.: Towards better error statistics for atmospheric inversions of methane surface fluxes, Atmos. Chem. Phys. Discuss., 13, 3735-3782, doi:10.5194/acpd-13-3735-2013, 2013.

Mobile lab

- “ICOS compliancy” verification
- inspection of
 - - infrastructure
 - - instruments
 - - maintenance protocols
 - - calibration gases
- Mobile instruments installed in measurement cabin (if possible)
- Sampling from main or secondary inlet
 - Optional installation of new inlet line
- Parallel measurements for 6-8 weeks
- Final report including recommendations



December 2013-February 2014
March-May 2014
May-July 2014

Hyytiälä, Finland
OPE, France
TBD

Mobile lab: instruments

- Picarro G2401
- FTIR by Ectotech
- CO-N2O by Los Gatos

New set of NOAA calibration gases has been ordered



Metadata

- q *Current*
- q *Forseen*
- q *For processing information*

- **Institute/laboratory/Company information**

Name, institute code if any, website address if any, postal address, contacts (mainly name, phone numbers and email. There is also a status indicating if the contact is still active)

- **Station information**

station identifier, a unique 3-letter code; name; owner; postal address; geo-localization (latitude, longitude, altitude); sampling level heights; description (text or pdf); images; documents

- **Instrument information**

unique identifier (provided by the ATC upon instrument registration); category; **model**; description; owner; serial identifier; date of purchase; nickname; funding; current instrument localization (in which station the instrument is installed); ancillary parameters; instrument images; instrument associated documents (i.e calibration protocol); installation details (i.e. use of a shelter, use of a heating system, distance to a poll)

- **Tank information**

unique identifier; **model**; owner; **valve**; **regulator**; **defect inspection**

- **Station information**

- use of a pump upstream of the measurement system (sample pressurization pump) (Yes/No)?
- use of a drying system to which the sample is exposed (Yes/No)? If yes, multiple choice from category list
- sample buffered (Yes/No)? If yes, multiple choice will be possible from a define category list
- sampling, conditioning and distribution system diagram, the Piping and Instrumentation Diagram (P&ID)
- (P&ID) part list should be provided, containing the equipment references. This list would only contain the critical components, directly in contact with the gas (i.e. tubing, valve, pressure regulator, sensors). Indicating the tubing diameter and length can be very valuable

- **Flask information**

- unique identifier; model; owner; valve; registration date; disposal date

- **NaOH container information**

- unique identifier; model; volume; manufacturer

- **Tank information**
 - tank mole fraction with its associated filling date and scale
 - tank usage (target tank, calibration tank, etc.) in association with an instrument on a given site
- **Calibration information**
 - Definition of a calibration episode
 - Calibration validation criteria

- **Metadata for ICOS dataset** will be distributed via **file** (header) and **website** (url).
 - Repartition between header and url is to be discussed.
 - Synthesis proposition for file header:
 1. will fulfill WMO metadata requirements,
 2. IMECC data file format heritage (based on NASA AMES file format adaptation),
 3. ICOS measurement and data handling specificity (traceability, calibration etc. ...)
- à Draft will be available on web for discussion

ICOS file: header proposition

HEADER BLOCK	EXAMPLE OF FIELD TO BE INCLUDED
Institute/ Laboratory/ Company Station information	Station latitude; Station longitude; WMO region; Country; Postal address of the station; Time Zone; GAW Category; Station Environment; ...
PI (contributor/contact person)	Contributor(s) name; Contributor(s) acronym; Contributor(s) country; Contributor(s) url; Contributor(s) name; ...
Measurement description	Time Zone; Sampling height; Sampling environment; ...
Instrument information	Measurement Method; Current status and history of instruments; Description of instruments: resolution; Calibration, current scale; Measurement calibration;
Data Processing and QA	Data processing; Data flag; program name: program version:
Extra	dataset_fair_use ; dataset_disclaimer : data remarks; URL towards complete metadata doi or PID;
DATA BLOCK	
One line per time stamp	

ICOS file: header fields

Number_of_header_lines;
 Station information category;
 Station name;
 Station manager name;
 Station manager acronym;
 Station manager adress;
 Station manager url;
 site_code;
 site_acronym;
 Contact person for station name;
 Contact person for station office adress;
 Contact person for station phone;
 Contact person for station email;
 Station latitude;
 Station longitude;
 WMO region;
 Country;
 Postal adress of teh station;
 Time Zone;
 GAW Category;
 Station Environnement;
 provider_number;
 dataset_start_date;
 dataset_stop_date;
 Contributor(s) name;
 Contributor(s) acronym;
 Contributor(s) country;
 Contributor(s) url;
 Contributor(s) name;
 Contact personn for measurement name;
 Contact personn for measurement office address;
 Contact personn for measurement phone number;
 Contact personn for measurement email;
 Observation Category;;

Situation;
 Parameter; from Table 2 to Table6 in Annex 1.
 Format_for_time_variable;
 Time Zone;
 Sampling heigth;
 Sampling type;
 Sampling and analysis frequency;
 Sampling environnement;
 Other decription for sampling and analyses;
 Measurement Method;
 source_Name;
 Current status and history of instruments;
 Description of instruments: resolution;
 Description of instruments: mesurement range;
 Description of instruments: linearity;
 Calibration, current scale;
 Measurement calibration;
 Data processing, measurement unit;
 Data processing;
 Data flag;
 program name;
 program version;
 dataset_fair_use;
 dataset_disclaimer;
 data remarks;
 Date_file_produced;;
 Mission_(Project)_Name;
 URL towards complete metadata;
 doi or PID;