

TA1

Applicant:

Josep-Anton Morguí, Baldiri Reixach 2. 08028 Barcelona (Spain)

TA site:

LSCE/CEA Paris (RAMSES) - France

Scientific content:

BGU (Begur, Catalonia, Spain) is a sampling site situated in the NE of the Iberian Peninsula (41° 58' N, 3° 14' E, 17 m.a.s.l). In January 2000, BGU flask sampling for greenhouse gases analysis was undertaken by the Climate Research Laboratory in the Science Park in Barcelona (LRC-PCB-UB). BGU site is sampled by the LRC-PCB in a weekly/biweekly basis from January 2000, with funds from the LRC-PCB own programs. In order to integrate BGU in the GHG analysis European network of atmospheric sites, collaboration between LRC-PCB, now IC•3 (Institut Català de Ciències del Clima) and the LSCE (Laboratoire des Sciences du Climat et de l'Environnement, LSCE-CNRS) was established. Flasks samples obtained from BGU were analyzed for GHGs by LSCE as a RAMCES site. Therefore, cost of analysis of BGU flasks samples was included and results disseminated in the Aerocarb and the CarboEuropeIP EU funded projects. In this form data obtained from the BGU sampling site has also been shared with partners in these projects. It is important to guarantee the continuity of this series from the Iberian Peninsula. Continuity of BGU sampling is assured by funds from the IC•3, formerly Climate Research Laboratory in the Science Park in Barcelona (LRC-PCB), but for the flasks analysis a number of units of Transnational Access from IMECC are requested. It is calculated that needs could be fulfilled along the 2009 year with 100 flasks analysis in the LSCE-CNRS facilities, without presence of researchers from LRC-PCB required. The minimum annual average of sampling is roughly a duplicate sample every 7 days, due to a greater effort in sampling from the IC•3.

Timing of the project: 2009

Requested units: 100

TA2

Applicant:

Jost V. Lavric, Orme des Merisiers, Bât.711, F-91191 Gif sur Yvette Cedex, France

TA site:

Mace Head - MHD - Ireland

Scientific content:

In the framework of the preparatory phase of ICOS, LSCE (<http://www.lsce.ipsl.fr/>) is responsible for the construction of a prototype instrument that will equip ICOS atmospheric stations (ICOS AS). The ICOS AS prototype will consist of commercially available instruments, assembled into an "integrated instrument". In order to choose the best adapted and performing instruments, LSCE is carrying out test series during the prototype construction phase.

The ICOS AS prototype will include instruments/equipments for continuous measurement of:

- 1) atmospheric concentration of carbon dioxide (CO₂), methane (CH₄), carbon monoxide (CO),
- 2) basic meteorological parameters (wind speed and direction, atmospheric pressure and temperature, relative humidity),
- 3) boundary layer height, and
- 4) vertical CO₂ flux.

The ICOS AS will also include an automatic flask sampler, which will allow the collection of discrete air samples for discontinuous observations of long-term trends and seasonal cycles of special tracers not easily measured continuously (i.e. isotopes in CO₂ and CH₄, O₂/N₂, hydrocarbons, etc.) and for independent measurement of gases continuously monitored for quality control. Continuous boundary layer height measurements at ICOS atmospheric sites will, together with the continuous greenhouse gas (GHG) measurements, allow establishing regional estimates of GHG fluxes.

Two test campaigns were planned to evaluate the available boundary layer height instrumentation from the point of view of real-time and processed data quality, field robustness, performance under varying weather conditions and price/performance ratio. The first campaign took place during three weeks at the LSCE site at the Traînou tower (near Orleans, France) in October 2008. The Mace Head station was chosen for the second campaign as it is a "clean air" site as opposed to the Traînou site (it is imperative to test the equipment under weather conditions as various as possible). The campaign will be done in collaboration with the Atmospheric Remote Sensing Group (D. Feist, G. Biavati) from the Max Planck Institute for Biogeochemistry (Jena, Germany). Our contacts at Mace Head are Colin O'Dowd and Giovanni Martucci from the Centre for Climate & Air Pollution Studies at the NUI, Galway, Ireland.

The planned total campaign duration at Mace Head is twenty seven days (04-30 June 2009), including three weeks of measurements (08-28 June 2009) and some additional days at the beginning (4-7 June 2009) and at the end of the campaign (29-30 June 2009) for de-/installation of the equipment. During the campaign, the access of personnel to the site will be due radio soundings (exact number and frequency remains to be determined) and eventual troubleshooting of the tested equipment.

Timing of the project: 04 to 30 June 2009
Requested units: 27

TA4

Applicant:
Caroline Nichol, University of Edinburgh

TA site:
Hyytiala - Pine forest - Finland

Scientific content:
Custom designed spectral sensors with the prescribed wavebands for an effective PRI calculation are currently being produced by Skye Instruments (UK). They have the capability of sampling the reflectance under any illumination conditions in each specified channel at a 1 Hz interval. One of

these sensors will be set up on the Hyytiala flux tower to capture the daily and seasonal variation in canopy PRI in the absence of any atmosphere. Each sensor (2 channel upward and downward pointing) is fitted with metal interference filters centred at 531 and 570 nm (FWHM of 5 nm) for PRI. This work will form part of a larger scientific collaboration between the University of Helsinki and Edinburgh during the next 2.5 years.

Timing of the project: 20/04/2009-25/04/2009

Requested units: 5

Applicant:

Caroline Nichol, University of Edinburgh

TA site:

Hyytiala - Pine forest - Finland

Scientific content:

Planned work; To undertake a series of flights with the Edinburgh research aircraft at Hyytiala as part of two projects: A remote sensing project, and a biomass burn project.

We aim to describe the temporal and spatial dynamics of photosynthetic light use efficiency (ε) and chlorophyll fluorescence (CF) at the Hyytiala site, and also carry out a series of remotely sensed and atmospheric measurements in support of the planned biomass burning experiment.

Fluorescence campaign details

A series of transect level flights will be carried out to map the spectral response of the vegetation along with airborne CO₂ fluxes. Maps of fluorescence and light use efficiency will be created along with maps of CO₂ exchange of the vegetation.

A series of flights will be carried out in support of the burn experiment being undertaken at Hyytiala. Remotely sensed data, aerial photographs and gas sampling will be undertaken, with exact details to be confirmed between Edinburgh and Helsinki.

Timing of the project. 15/05/2009- 30/06/2009

Requested units: 60

TA1

Applicant:

Michela Maione, University of Urbino-Italy, Institute of chemical Sciences

TA site:

MPG Jena (Isolab)- Germany

Scientific content:

A continuous system for monitoring greenhouse gas has been installed at the Italian station of MteCimone (44°11'N, 10°42'E) -regional GAW station for ozone- ; many different species are continuously analyzed by different groups / instruments. In particular since the summer 07 a new set up is available to measure the atmospheric concentration of CO, CH₄, SF₆ and N₂O. The calibration of the instrument has been performed against a commercial standard mixture prepared by gravimetric dilution in synthetic air. In order to achieve the best performance of the instrument, the best intercomparability of the local calibration scale with other available measurements and finally to share the results with a wider scientific community, a intercalibration exercise is indeed necessary. The opportunity offered by the TA1 activities is desirable, in particular the service offered by the MPG Jena is requested to calibrate the air gas mixture for the interested compounds, prepared in the high pressure cylinders in use at our station..

Timing of the project: 6 months 2009

Requested units: 60

Applicant:

Christophe Chipeaux, INRA LAB EPHYSE

TA site:

MPG Jena (Isolab)- Germany

Scientific content:

My project is the national french programs "Cats", it's a project about the labelling of full young trees in ¹³CO₂ in 3 sites in France (Nancy , Orsay and my site Bordeaux) with the same experiences but the trees are different . We do it to measure the respiratory flux and the isotopologue analyse of sugars. The respiratory flux is measured by TDLS (TGA 100 Campbell Scientifique) and the accuracy of this measure depends of the calibration of my gas tank in ¹²CO₂, ¹³CO₂ and ¹²C¹⁸O¹⁶O, I need a equivalent of 40 flasks (1 gas tank = 10 flasks).

Timing of the project: february 2009

Requested units: 40

TA2

Applicant:

Dr. MAHIEU Emmanuel, Institute of Astrophysics and Geophysics, University of Liège

TA site:

Jungfrau hoch - UBERN - Switzerland

Scientific content:

Comparison of ground based CO₂ data with column integrated CO₂ profiles at JFJ

With this proposal we initiate a collaboration between the University of Liège, Dr. E. Mahieu and the University at Bern, Prof. M. Leuenberger. The aim of this collaboration is to compare the groundbased CO₂ measurements performed by Prof. M. Leuenberger with column integrated measurements made by Dr. E Mahieu at the remote High Altitude Research Station Jungfrauoch. It is well-known that the vertical distribution of CO₂ is key information to better understand the carbon cycle and the influence of fossil fuel emissions to it. In this respect it is worthwhile to compare those ground-based NDIR CO₂ measurements with FTIR column integrated measurements. This collaboration is an intermediate step to compare ground-based data with upcoming satellite data from GOSAT and OCO. It leads to added value of the IMECC principal goals. We plan several campaigns of coordinated measurements.

Timing of the project: february 2009-2010

Requested units: 64

TA5

Applicant:

Markus Leuenberger, University of Bern/Climate and Environmental Physics

TA site:

MPG Jena (Isolab)- Germany

Scientific content:

We plan to start continuous carbon isotope measurements on Jungfrauoch next year. At present there is a campaign at Jungfrauoch for measuring carbon as well as oxygen isotopes on carbon dioxide with a dedicated laser system at the state of the art precision using such instrumentations. This work is done in collaboration with EMPA (PI: Dr. Lukas Emmenegger). For the continuous measurements we need access to well calibrated standard gases (3 cylinders) with pre-assigned CO₂ concentration values (to be matched within about 5 ppm) and well assigned carbon and oxygen isotope values for carbon dioxide covering a range of about 10 permil. Pre-assigned values yet to be defined.

Timing of the project: April 2009

Requested units: 3

TA6

Applicant:

Sabrina RADDI, DiSTAF - University of Firenze

TA site:

Hyytiala - Pine forest - Finland

Scientific content:

A novel hyperspectral VIS-NIR field spectrometer has been recently developed at our Institution as part of a national project. The instruments makes it possible to monitor continuously hyperspectral incoming and outgoing radiance, and to derive remote-sensing indexes of photosynthetic performance such as PRI (Photochemical Reflectance Index) and SIF (Solar-Induced Fluorescence). The aim of the present proposal is to monitor the springtime recovery of photosynthetic activity at the Hyytiala site, and the comparison of the RS measurements with eddy-covariance estimates.

Timing of the project: 01/04/2009-15/05/2009

Requested units: 45

Applicant:

Ingeborg Levin, Institut für Umweltphysik, University of Heidelberg

TA site:

Cabauw - ECN - Netherlands

Scientific content:

Perform quasi-continuous two-weekly integrated as well as occasional diurnal cycle sampling of $^{14}\text{CO}_2$, in order to develop a suitable strategy to determine the fossil fuel CO_2 component at high temporal resolution from quasi-continuous CO observations. These quasi-continuous CO together with CO_2 observations routinely measured at Cabauw will be needed for the interpretation of $^{14}\text{CO}_2$ results.

Timing of the project: 01082009-31072011

Requested units: 182

TA1

Applicant:

Elena Popa, ECN Netherlands, P.O. Box 1, 1755 ZG Petten, The Netherlands

TA site:

MPG Jena (Isolab)- Germany

Scientific content:

An independent means to regularly check the accuracy of the in-situ measurements is missing at this moment. We aim to cover this need by starting a comparison program with the laboratory that provides our calibration cylinders. Flask samples will be filled at Cabauw, using an independent apparatus and dedicated sampling lines, and will be sent to be measured by the MPI-BGC laboratories. The comparison of in-situ measurement with results of flask samples will provide an important means to monitor and assess the accuracy of in-situ measurements.

The program will consist in three sampling types:

1. A test campaign at the beginning of activity for the check / validation of the new equipment.
2. Between 1-Mar-2009 and 28-Feb-2011, weekly flask sampling will be made from one sampling height (200 m agl).
3. Event sampling for vertical profiles during particular meteorological conditions – approximately 2 times / year.

Timing of the project: 2009-2011

Requested units: 363 (159 for 2009)

TA3

Applicant:

Hrvoje Marjanovic, Forest Research Institute, Cvjetno naselje 41, HR-10450 Jastrebarsko, Croatia

TA site:

Allumiere - UNIBO and CNR-IBIMET - Italy

Scientific content:

however, concerning the Mediterranean species such as *Arbutus unedo* L., *Quercus ilex* L etc. the practical application of dendrochronological methods to understand growth patterns in this region is lacking because vegetative activity does not always have a regular dormancy period so that annual tree rings are not always formed (Cherubini et al., 2003). The aim of the planned project is to install a set of manual and a few of automatic electronic dendrometers that would be usable over several seasons and measured periodically for at least one year. Dendrometers will be installed in all treatments applied in the Tolfa Allumiere research station (control, dry and wet) in order to assess the influence on diurnal, seasonal and annual tree growth and annual NPP. In total we plan to install

at least 300 manual dendrometer bands (100 per treatment). High precision of measurement with manual dendrometers (better than 1/10 of mm in diameter) and low cost of making and installing them is particularly suitable for trees with low stem increment such as those in Tolfa Allumiere forest. A combination of several (more expensive) electronic dendrometers that can record hourly stem size fluctuations and large number of (cheap) manual one will enable us to reconstruct with high reliability the growth dynamics of each of the three treatments.

Requested units 730 (2009-2010)

TA1

Applicant:

Elena Popa, ECN Netherlands, P.O. Box 1, 1755 ZG Petten, The Netherlands

TA site:

MPG Jena (Isolab)- Germany

Scientific content:

The Cabauw tall tower is one of the atmospheric measurement stations set up under the CHIOTTO project, and is presently being operated as part of the CarboEurope Atmospheric Component. CO₂, CH₄, CO, N₂O, SF₆ and H₂ are measured in-situ, continuously. The calibration scales are based on standard gases in high pressure cylinders provided by MPI-BGC Gas-Lab in 2004.

In order to continue the measurements, we need new calibration gases from MPI-BGC as follows.

- one cylinder in 2008
- one cylinder in early 2009
- three cylinders late 2009.

In TA1 this equals $5 \times 10 = 50$

Requested units 50

Applicant:

Michael Patecki, University of East Anglia, School of Environmental Sciences, United Kingdom

TA site:

MPG Jena (Isolab)- Germany

Scientific content:

We request analyses of CO₂ concentration and O₂/N₂ ratios from 6 flasks. Results of the flask measurements will be compared to measurements of our continuous O₂/CO₂ system to determine whether part of the gas handling structure (mainly the air inlet and water extraction cascade) introduces bias to the measured CO₂ and O₂ concentrations.

Requested units 6

Applicant:

Jaroslav M. Necki, AGH - University of Science and Technology, Faculty of Physics and Applied Computer Science, Department of Environmental Physics, Gas Chromatography Laboratory, Krakow, Poland

TA site:

MPG Jena (Isolab)- Germany

Scientific content:

Our main focus is to balance carbon gases in urban environment of Krakow City. Our main focus is to balance carbon gases in urban environment of Krakow City. We would like to wider our working standard sets from the continental background values up to 450 ppm and higher if possible. For that purpose we have prepared 3 tanks with different concentration levels. We would like to ask for the calibration of those tanks and preparation of additional one in our tank at ambient level.

Requested units 3

Applicant:

Bela Tuzson, Empa, Swiss Federal Laboratories for Materials Testing and Research, Ueberlandstr. 129, CH-8600 Duebendorf

TA site:

MPG Jena (Isolab)- Germany

Scientific content:

A recently developed instrument employing direct absorption spectroscopy was installed on the high altitude research station Jungfrauoch (Switzerland) for in situ and continuous measurements of d13C and d18O in atmospheric CO₂. The spectrometer employs a novel quantum cascade laser as light source, combined with thermoelectrically cooled IR-detectors. This design allows for cryogen-free operation, thus facilitating long-term and unattended operation. The fully automated instrument is supervised remotely from our laboratory.

We have repeatedly demonstrated that this prototype instrument achieves a precision better than 0.1 permil for isotope ratio measurements. However, its accuracy highly depends on the quality of the calibration gases. Furthermore, as any new analytical technique, QC laser spectroscopy needs to be validated against the well established high precision isotope ratio mass spectrometry method.

This proposal addresses these issues by seeking support through the IMECC project to access one of the highest quality atmospheric measurement laboratories with the aim of obtaining internationally accepted secondary standards and to perform validation experiments at Jungfrauoch. We intend to achieve this in two consecutive steps.

First, we link our calibration gases to the international scale (WMO and V-PDB). For this, we intend to have our current working standards quantified by GASLAB (MPG, Jena, Germany), using well conditioned flasks, also supplied by GASLAB.

Requested units 40

Applicant:

John Moncrieff, The University of Edinburgh, School of GeoSciences, Kings Buildings, EH9 3JN

TA site:

MPG Jena (Isolab)- Germany

Scientific content:

Standards for Tall Tower Angus

RU: 40

Applicant:

John Moncrieff, The University of Edinburgh, School of GeoSciences, Kings Buildings, EH9 3JN

TA site:

ISCE/CEA Paris (RAMSES) - France

Scientific content:

Analysis of air sampling flasks flown in vertical profiles over Griffin Forest, UK

Requested units 50

Applicant:

DELMOTTE Marc, LSCE (CEA/CNRS/UVSQ), CE Saclay, L'orme des merisiers, Bâtiment 701, Point courrier n° 129, 91191 Gif sur yvette Cedex

TA site:

MPG Jena (Isolab)- Germany

Scientific content:

Measurement of O₂/N₂ ratio in flasks (42) from the CarboOcean/Polarcat continuous atmospheric monitoring station of Ivittuut (Greenland). The measurements will be used as quality control as well as independent check of the continuous measurements provided by the in-situ instrument. LSCE has no capability to measure high precision O₂/N₂ ratio at the moment.

Calibration of new compressed air cylinders (2) for O₂/N₂ ratio, to be used as new reference gas and for further inter-calibration, within the same scientific context (CarboOcean, Ivittuut station).

Requested units 62

TA5

Applicant:

Michael Patecki, University of East Anglia, School of Environmental Sciences, United Kingdom

TA site:

MPG Jena (Isolab)- Germany

Scientific content:

We request preparation of one 20L cylinder. The cylinder will be used as calibration gas ('low span') for our continuous O₂/CO₂ system at the Atmospheric Observatory in Weybourne, Norfolk, United Kingdom

Requested units 1

Applicant:

Jaroslav M. Necki, AGH - University of Science and Technology, Faculty of Physics and Applied Computer Science, Department of Environmental Physics, Gas Chromatography Laboratory, Krakow, Poland

TA site:
MPG Jena (Isolab)- Germany

Scientific content:

Our main focus is to balance carbon gases in urban environment of Krakow City. Our main focus is to balance carbon gases in urban environment of Krakow City. We would like to wider our working standard sets from the continental background values up to 450 ppm and higher if possible. For that purpose we have prepared 3 tanks with different concentration levels. We would like to ask for the calibration of those tanks and preparation of additional one in our tank at ambient level.

Requested units 1

Applicant:
Yver Camille, LSCE-91191 Gif-sur-Yvette, France

TA site:
MPG Jena (Isolab)- Germany

Scientific content:

In the frame of the European project Eurohydros, LSCE is monitoring Hydrogen and Carbon monoxide within our network (one in-situ station and 10 flask sampling sites). All Eurohydros partners are all using the same scale for Hydrogen in order to ensure intecomparison of data. The set of 8 standard gases prepared at the Max Planck will be used as secondary scale and dilution tanks to calibrate Hydrogen and Carbon Monoxyde data for the Eurohydros network.

Requested units 8

Applicant:
Elena Popa, ECN Netherlands, P.O. Box 1, 1755 ZG Petten, The Netherlands

TA site:
MPG Jena (Isolab)- Germany

Scientific content:

The Cabauw tall tower is one of the atmospheric measurement stations set up under the CHIOTTO project, and is presently being operated as part of the CarboEurope Atmospheric Component. CO₂, CH₄, CO, N₂O, SF₆ and H₂ are measured in-situ, continuously. The calibration scales are based on standard gases in high pressure cylinders provided by MPI-BGC Gas-Lab in 2004.

In order to continue the measurements, we need new calibration gases from MPI-BGC as follows.

- one cylinder in 2008
- one cylinder in early 2009
- three cylinders late 2009.

Requested units 5

Applicant:

DELMOTTE Marc, LSCE (CEA/CNRS/UVSQ), CE Saclay, L'orme des merisiers, Bâtiment 701, Point courrier n° 129, 91191 Gif sur yvette Cedex

TA site:
MPG Jena (Isolab)- Germany

Scientific content:
Within the framework of the CarboOcean IP and the IPY Polarcat project, a new continuous atmospheric station has been set up in summer 2007 in Ivittut, Southern Greenland. In order to routinely run the continuous instrumentation, (O₂ and CO₂) we need to regularly run calibration and reference gases to infer high precision and quality measurements. These gases consists of natural air compressed into 50l high pressure cylinders. In order to enable a full year of automatic measurements on site, we request the filling of 9 high pressure tanks with natural air.

Requested units 9

Applicant:
John Moncrieff, The University of Edinburgh, School of GeoSciences, Kings Buildings, EH9 3JN

TA site:
MPG Jena (Isolab)- Germany

Standards for Tall Tower Angus

RU: 40

TA6

Applicant:
Caroline Nichol, GeoSciences, Univ Edinburgh, Crew Building, Edinburgh

TA site:
SMEARII Hyytiala, University of Helsinki

Scientific content:
We will use two remotely developed methods to detect changes in photosynthesis at the canopy scale using tower, aircraft and satellite-based remote sensing systems. In doing so we will describe the temporal and spatial dynamics of photosynthetic light use efficiency and chlorophyll fluorescence (CF) in contrasting vegetation types in a north-to-south climate gradient. This study will greatly advance understanding of the dynamics of seasonal and temporal carbon uptake by forests and produce vital recommendations for future remote sensing observation platforms dedicated to carbon cycle research. We propose to conduct this study in contrasting forest types and climatic regimes, in Scotland and Finland (Hyytiala). The Finnish area is chosen because of the intense seasonal effects, which contrast with the more maritime influence in Scotland

Requested units 12

