dition, the enhanced CHOCHO signal observedby satellite instruments in equatorial regions indicates our insufficientunderstanding on source processes of CHOCHO. To date, no previous in situ CHOCHO observations have beenavailable from aircraft owing to the difficulties in ambient levels of detection.

In support of the scientific goals of SENEX 2013 (SoutheastNexus) to investigate the role of anthropogenic and natural emissions in ozoneand aerosol formation and their climate impact, we developed the AirborneCavity Enhanced Spectrometer, ACES. This instrument provides rapid, sensitive in situ measurements of CHOCHO and othertrace gases important in tropospheric oxidation chemistry, such as NO2and HONO. The presentation will include a brief description of the working principleand performance of the new ACES instrument.

We presentthe first in situ CHOCHO map oversoutheast US. The region is strongly influenced by emissions of isoprene, whoseoxidation is a major CHOCHO source. Theregion also has large anthropogenic emissions from urban and power plant plumesthat may influence isoprene oxidation and glyoxal formation. Finally, we sampled several air massesheavily influenced by emissions from shale gas extraction. We examine thegeographical distribution of glyoxal across a range of different air masses. Thecontrast between these air masses, together with 0-D box modeling calculations usingexplicit VOC degradation mechanisms (MCM3.2v), allow us to assess CHOCHO formationprocesses from oxidation of different VOCs together with CHOCHO sink mechanisms,including photochemical degradation and aerosol uptake. The results will becompared with recent results from similar measurements in other regions, suchas urban area (Los Angeles, CA) and a remote oil and gas producing area in Utah.Vertical profiles of CHOCHO, which are useful for satellite validation, as wellas yields of CHOCHO from pyrogenic emission from biomass burning plumes will bepresented.

P2.27 - COMPLEX GREENHOUSE GAS MONITORING AND RESEARCH PROGRAMS AT A WMO GAW TALL TOWER SITE IN CENTRAL EUROPE

László Haszpra; Zoltán Barcza; Dóra Hidy; István Major; Mihály Molnár; Tímea Haszpra
Hungarian Meteorological Service; Eötvös Loránd University; Szent István University; MTA Institute for Nuclear Research; MTA Institute for Nuclear Research; MTA Research Centre for Astronomy and Earth Sciences
haszpra.l@met.hu; bzoli@elte.hu; dori.hidy@gmail.com; imajor@atomki.mta.hu; mmol@atomki.mta.hu; talitimi@gmail.com

The poster presents the monitoring and research programs performed at the tall tower GHG monitoring site of Hungary (Hegyhátsál, 46°57'N, 16°39'E, 248 masl), member of WMO GAW network. The monitoring site is located in a rural environment, far away from major anthropogenic pollution sources. Continuous CO2 mole fraction measurements at four elevation levels (10 m, 48 m, 82 m and 115 m) since 1994 and aircraft measurements between 2001 and 2008 provided information on the long term trend of CO2 concentration, on its vertical distribution in the atmospheric boundary layer and on the effect of regional scale climate fluctuations on the overall trend. Since 2006 CH4, N2O and SF6 concentrations are also measured at the site. Eddy covariance (EC) system mounted at 82 m above the ground gives information on the CO2 exchange, and on its temporal variation, of the surrounding typical, mixed agricultural region. The poster presents the relation of the regional weather and the annual net ecosystem exchange (NEE). In-field experimental data show that ecosystems may become significant net CO2 sources under unfavorable climate conditions, although they are predominantly form a net CO2 sink on annual scale from the point of view of the atmosphere at present. While these measurements can be considered regionally representative, and in this sense they are unique among the common EC based NEE measurements, another EC system at the site

mounted at 3 m above the ground monitors the CO2 exchange of semi-natural grass. The two EC systems provide the experimental background for the development of process-oriented ecosystem models capable to handle also land management and to predict NEE (and other important carbon balance components) under future climate conditions. Since 2008 monthly integrated atmospheric CO2 samples have been taken for carbon isotope measurements. Radiocarbon (14C)measurements show us the monthly average ratio of CO2 of biospheric and of fossil origin for the better evaluation of the anthropogenic influence on the atmospheric carbon budget in this densely populated, highly industrialized region of the world.

P2.28 - TRANSPORT AND DISPERSION OF TROPOSPHERIC OZONE AND ITS EFFECTS ON THE SECONDARY METABOLISM OF TIBOUCHINA PULCHRA (CHAM.) COGN. IN THE METROPOLITAN AREA OF VALENCIA - SPAIN

Lucia Helena Gomes Coelho; Ana Clara da Rosa Santos; Claudia Maria Furlan;
Universidade Federal do ABC;Universidade Federal do ABC;Instituto de Biociências, Universidade de São Paulo - SP;
lucia.coelho@ufabc.edu.br;anacl.rosa@gmail.com; furlancm@ib.usp.br;

Alongside the problems caused by air pollution which are widely exposed in the media, it is also of great concern the interference of some atmospheric pollutants in growth and development of tree species. Among all the pollutants, ozone, which presents toxicity at lower atmospheric layers, has being studied in the last decades by a lot of researchers all over the world.

Like other urban centers, metropolitan region of Spain offers special meteorological and geographical condition that provides the photochemical reactions responsible for tropospheric ozone formation. Thus, the Spanish government has developed some tools to ensure monitoring and decreasing ozone levels. In the metropolitan area of Valencia and cities nearby, there is an example: a large atmospheric pollution monitoring network which includes approximately 50 stations spread along cities with distinct socioeconomic and geographical features. The data collected in these areas are published periodically in the official website ofConselleria de Infraestructuras, Territorio y Medio Ambiente, and since they are public, it was possible to analyze transportation and dispersion of ozone in Valencia throughout a graphical utility problem such as the one used in that work: HYSPLIT (Hybrid Single-Particle Lagrangian Integrated Trajectory) software. With HYSPLIT it was possible to calculate the dispersion of a pollutant by assuming either puff or particle dispersion. The puff model – considered in that work – outstands that the puffs expand until they exceed the size of the meteorological grid cell (either horizontally or vertically) and then split into several new puffs, each with it's share of the pollutant mass.

Another focus of this work was the evaluation of some secondary metabolites in samplings of a Brazilian tree species, Tibouchina pulchra, an ozone bioindicator, native on Atlantic Rain Forest. The analyses demonstrated the risks the tree species, inhabitants of metropolitan area of Valencia and its surroundings are crossing over, which are larger in hot seasons, especially in Summer, when ozone levels increase and the restriction of exposure to ozone imposed by laws are often exceeded. Regarding the secondary metabolism of T. pulchra, it was observed a variation in phenolic compounds: some of them demonstrated a tendency to increasing (anthocyanins), and others decreased (tannins) after ozone exposure.