

## **ABOUT US:**

**metcon inc. (USA)** and **meteorologieconsult gmbh** are environmental consulting companies specialized in:

- Scientific studies of air chemistry and meteorology
- Development and production of air chemistry research instruments

**meteorologieconsult gmbh** was founded in 1976 in Germany. A selection of scientific papers published by Rainer Schmitt, founder and principal scientist, are provided below. We have been involved in a number of scientific activities over the years, including studies at the GAW-station Izana, Tenerife, in the Canary Islands.

We develop and produce radiometer and spectrometer devices to measure actinic fluxes and photolysis frequencies of NO<sub>2</sub>, NO<sub>3</sub>. The devices are based on our unique development of an optical inlet system with isotropic 2- $\pi$ -characteristics. We also produce special versions of the radiometers and optical inlet systems which are used globally aboard scientific aircraft. We also produce spectral radiometers based on a small high precision double monochromator as well as on a fast spectral radiometer using a static, monolithic monochromator with a diode array detector and a very sensitive and fast CCD-detector.

The other devices we produce are automatic gas chromatographs for the detection of PAN and CH<sub>4</sub> and CO<sub>2</sub> in the remote clean troposphere. Our PAN device is equipped with a unique and state-of-the-art gasphase calibration unit which does not require the use of super cooled liquids to produce PAN.

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**Compendium of Current and Previous Projects Carried out by**  
***meteorologieconsult gmbh***  
**Principal Investigator: Rainer Schmitt**

- Participation in the Houston TexAQS-II
- Participation in a air chemistry – research activity in Lanzhou, China
- Feasibility study related to the use of optical fibers in a moving direct sun tracker.
- Development of ultra-fast CCD-spectrographs for irradiance-, direct sun- and actinic- measurements.
- Participation as P.I. in the EU R+D-project INSPECTRO: UV-radiation and clouds
- Comparison of measurements and results of a global climate model (MOZART): Funded by the German Minister of Science and Technology (sub-contractor of MPI, Hamburg).
- Participation as P.I. in the EUR+D project ADMIRA: Relation of irradiance and actinic flux data under different meteorological conditions.
- Ozone in Hessen, a regional Ozone-study. In co-operation with the University of Frankfurt, funded by the regional government.
- Instrument development (Peroxyacetylnitrate, PAN, PPN, MPAN) co-funded by the DBU
- Participation in an EU R+D project PAUR II
- Participation in the international J-intercomparison project (IPMMI), Boulder, USA.
- Coordination of an EU R+D project studying the ozone budget over the Atlantic (BOA).
- Assessment of the suitability of a mountain station (Zugspitze) as the German high altitude observatory, in cooperation with Prof. H.-W. Georgii, Frankfurt.
- Development of a statistical-synoptical model for the prediction of summer smog (ozone) use by the German EPA, (R+D-project funded by UBA)
- Establishment and supervision of a training program for setting up a BAPMoN/EMEP station.
- Participation in an European inter-calibration project for PAN, (EU R+D-project STEP)
- Participation in EU R+D-project PAUR I.
- Development and production of spectrometers: Fast diode array spectrographs and double mono spectrometers as well as receptor optics: irradiance (cosine response), actinic (2-pi-resposne) and direct sun. Wavelength range from UV to NIR.
- Development and production of photoelectric instruments for the determination the photolysis rates of NO<sub>2</sub> and Ozone. Responsibility for QA/QC of all devices internationally operated.
- Participation the EU-R+D project SUSPEN: Inter-comparison of irradiance measurement instrumentation using spectrometers.
- Development of an automatic NMHC-GC for GAW applications, now operated at the GAW-station Zugspitze, Germany. Funded by DBU.
- R+D project assessing the loading of Europe with nitrogen oxides and their oxidation products. Included was the establishment of an emission inventory of NO<sub>x</sub> and VOC in Europe. Development of a source-receptor relation of NO<sub>x</sub> in selected regions in Germany.
- TOR (Tropospheric Ozone Research) sub-project of EUROTRAC: Installation and operation of a clean air tropospheric measurement station, and the scientific interpretation of trace gas measurements (NO, NO<sub>2</sub>, NO<sub>y</sub>, PAN, NMHC, CFCs, O<sub>3</sub>, CO, CO<sub>2</sub>, CH<sub>4</sub>, JNO<sub>2</sub>, JO<sup>1</sup>D).
- Development of an automatic PAN-GC. Contract with the German EPA (UBA, Berlin)
- R+D project investigating concentrations of selected air pollutants in the free troposphere. Contribution of long range transport from the American and the European continents to the budget of the troposphere over the North Atlantic.
- Investigation of atmospheric chemical effects resulting from an airport, including the regional effects of the associated air traffic (Airport in Switzerland) .
- Establishment of a investigation program for the determination of trans-boundary and long-range transport of air pollutants (Funded by the UBA, Germany).
- Development of an automatic CO<sub>2</sub>/CH<sub>4</sub>-Gaschromatograph
- Installation and operation of a WMO-baseline (GAW-station) station at Tenerife, Canary Islands, through multi-year R+D-projects.
- Study of the air quality in Santiago de Chile

- Meteorological and air quality investigations in developing countries, including an experimental investigation of rain out/ wash out of trace elements from the stack plume of a power plant, and determination of wet deposition below the plume.
- Model calculations of the effects of humidity on plume rise from stacks, using a cooling tower plume model.
- Formulation and application of a dispersion model for aircraft emissions: mobile point sources, puff dispersion, line sources and area sources. In cooperation with Prof. H. Fortak, Berlin. The model was used to assess the impact of a large airport on regional emission levels relative to emission levels from vehicles, home heating and industry.
- Numerous studies in accordance with the German Clean Air Act (BImSchGe) in part using modified Gaussian plume models.
- Studies on the impact of industrial plants, urban development and power stations on climate and air quality based on TA-Luft.
- Investigation of the meso-climate in the region of Basel (Switzerland) region in the upper Rhine Valley. (Hochrheingraben, Switzerland and southern Oberrheingraben, Germany).

**Recent publications: Dr. Rainer Schmitt**

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