

# NEWS LETTER 2

AUTUMN 2007

Scintillometry in China

Introduction of SOLYS 2

Industrial Applications in Germany

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## This Autumn is Full of Innovation

The positive feedback on our first Newsletter, published this Summer, has really encouraged us to start on the second issue. Now that Summer is over and we are all back from our holidays it is time to focus on our upcoming events and new developments.

For Kipp & Zonen the Summer has not really been a quiet period. We have been busy finalising our new automatic sun tracker, the SOLYS 2. This is a completely new design using the latest control and motor-drive technologies. One of the primary targets was user friendliness in setting up, operation and maintenance. Read all about it in this newsletter.

Together with the very successful 2AP, Kipp & Zonen now offers sun tracking solutions for all geographical areas and meteorological circumstances; from mild climates to extreme environmental conditions. SOLYS 2 will be launched during the European Conference on Applications of Meteorology (ECAM) from 1 to 5 October 2007 in San Lorenzo de El Escorial, Spain. This innovative product will be fully loaded on display at our booth. I will be more than happy to meet you there and introduce you to SOLYS 2.

Since 2005, when Kipp & Zonen celebrated its 175<sup>th</sup> anniversary, we annually issue an award for a published scientific paper on research related to solar radiation and its direct effects on climate in the boundary layer. Writing this column, we are still in the decision making process on who will be this year's winner. The announcement will be made at the annual meeting of the European Meteorological Society (running alongside ECAM) and published in our next issue. I'm very curious to see which study will win.

Enjoy our newsletter and who knows, maybe we will meet in San Lorenzo de El Escorial.

With best regards,

Ben Dieterink, President

## THIS ISSUE

### PAGE 2 WELCOME

By Ben Dieterink

### PAGE 3 NEWS

Introduction of SOLYS 2  
UVIATOR Software  
LIDAR Demonstration

### PAGE 4 CASE STUDY

Scintillometry in China

### PAGE 5 DEVELOPMENT

SOLYS 2

### PAGE 6 ON-SITE

Rolf Gengenbach Messtechnik

### PAGE 7 INSIGHTS

Kipp & Zonen France  
Developments at Mierij Meteo

### PAGE 8 OFFICES

Contact & office details

*If you have a news item for the news letter or want to share your experiences with Kipp & Zonen applications and contribute to our next issues, please e-mail the editor:*

*Kelly.Dalu@kippzonen.com*



## Improving the Accuracy of UV Measurements with UVIATOR Software

The UVIATOR software significantly increases the accuracy of UV-A, UV-B and UV-E measurements by the Kipp & Zonen broadband UVS radiometers.

In general, all broadband filter-based UV instruments have limited performance due to the mismatch between the sensor response and the solar UV spectrum. By knowing this mismatch in detail one can compensate for different measurement conditions.



All our UVS sensors are spectrally characterized during calibration. Kipp & Zonen created the UVIATOR software for the post-processing and extensive analysis of the measured UV data to give the most accurate results available.

UVIATOR bases the correction methodology on an atmosphere transmission model and the use of the Ozone Monitoring Instrument (OMI) satellite data that can be retrieved from the internet. This satellite gives the total Ozone column density based on position (longitude and latitude) and time.

UVIATOR is available as of October 2007. All our UVS radiometers will be delivered with the software standard included.



## New Plug and Play Sun Tracker: SOLYS 2

Kipp & Zonen introduces SOLYS 2, a completely new sun tracker with a high level of performance and reliability that is much easier to install and operate than any other tracker on the market.

A unique feature is the integrated GPS receiver to automatically configure location and time data upon installation. It is the only fully automatic sun tracker available that does not require a computer and software for setup.

SOLYS 2 is delivered complete with a tripod stand and mountings for a CH1 pyrheliometer. Options include a shading assembly, active tracking sun sensor and a heater for operation down to  $-40^{\circ}\text{C}$ .

[Read more on page 5](#)

## New: Scanning LIDAR

LIDAR is the acronym for Light Detection And Ranging and is the optical equivalent of RADAR. It is an active remote sensing technique for monitoring atmospheric processes and properties. A key advantage of this technique is the ability to provide ranging (distance) information and to derive profiles. Typical applications include the study of atmospheric dynamics, aerosols, pollution development, cloud base, cloud properties and water vapor profiles.

Raymetrics' latest development is a compact, fully automated, scanning



LIDAR system capable of retrieving 2D aerosol profiles of the atmosphere. The system is based on the cost-effective, reliable, turn-key technology Raymetrics offers, combined with tracking and positioning technology from Kipp & Zonen. The system is eye-safe and can be deployed virtually any-where in a short time. Thanks to the IP55



environmental protection it is suitable for continuous outdoor operation. Furthermore, the system can be upgraded with polarization and Raman detection for specific measurement requirements.

## Demonstration in London

In November of this year a demonstration of this LIDAR system and other remote sensing instruments from Kipp & Zonen will be held in the centre of London. More information on the upcoming demonstration and LIDAR in general is available from Martin Veenstra. ([martin.veenstra@kippzonen.com](mailto:martin.veenstra@kippzonen.com)) or at [www.kippzonen.com/lidar](http://www.kippzonen.com/lidar)

*Kipp & Zonen is the exclusive worldwide distributor for the unique and innovative LIDAR systems designed and produced by Raymetrics S.A. of Athens, Greece.*





## Practical Scintillometry in the Yellow River Basin

There is a growing world-wide interest in monitoring surface heat fluxes, the energy balance and evapotranspiration. This is fuelled by the increasing need for the efficient management of drinking water and improving weather forecast models to predict extreme weather. The Dutch remote sensing company Environmental Analysis and Remote Sensing (EARS) has developed an Energy and Water Balance Monitoring System (EWBMS) which utilises Kipp & Zonen Scintillometer systems for measuring sensible heat flux and evapotranspiration.

The Yellow River, or Huanghe, is the second longest river in China. It has its source in China's far west, it loops north, bends south, and flows east for approximately 5,500 km until it empties into the sea, draining a basin of 745,000 km<sup>2</sup>, which nourishes 120 million people.

In the past 10 years the Yellow river has frequently fallen dry due to insufficient information and lack of control on water distribution.

Current hydrological models are sophisticated, but that their performance is restricted due to lack of input data. Current measuring stations are too far apart to create a fair representation of the rainfall field.

The EWBMS of EARS, is currently being used in China to predict the Yellow River runoff and to measure the distribution of drought in the Yellow River basin on the basis of satellite data. It is the first system in the world to map the evaporation of water from the Earth's surface. Important EWBMS output files are

daily evapotranspiration and daily and 6 hourly rainfall maps of the basin at 5 km resolution. The rainfall and evapotranspiration information is used to feed the water resources hydrological model developed by UNESCO-IHE in Delft. With this information the allocation of scarce river water is tuned to the needs in a cost-effective way.



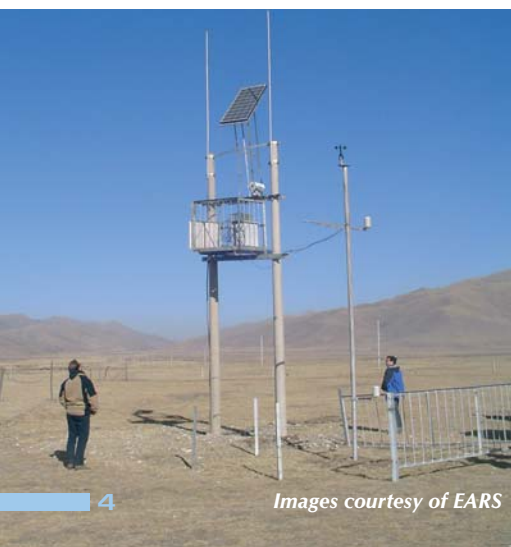
In the initial stages of the implementation of EWBMS, validation of the satellite output plays a vital role. This is performed using four Large Aperture Scintillometer Evapo-Transpiration (LAS-ET) systems from Kipp & Zonen. These systems provide near-real time measurements of the path averaged sensible heat flux, net radiation and Evapotranspiration over a path of approximately 5 km. This path length approximates the satellite pixel size. Therefore the measurements from a LAS-ET system can be used to validate satellite data of sensible heat flux, net radiation and evapotranspiration.



A scintillometer measures fluctuations in the density of air. These fluctuations are caused by heat and moisture fluxes exchanged between the Earth's surface and the lower part of the atmosphere. Combined with standard meteorological measurements like wind speed, temperature and humidity, the sensible heat flux is derived. Additional measurement of the net radiation balance and the soil heat flux yields the evapotranspiration. The LAS-ET systems provide an all in one solution. It contains all the required measurement instruments and data acquisition. The included EVATION<sup>®</sup> software package offers a very user friendly interface for processing all the measured data, easy data storage and graphical representation at the click of a button. Furthermore Kipp & Zonen can provide extensive technical support due to years of experience in the field of scintillometry.

*For more information on LAS-ET Systems please visit our website.*

*For more information on the EWBMS please contact EARS: [www.ears.nl](http://www.ears.nl)*



## Introducing a New Sun Tracker: SOLYS 2

Interest in high quality solar radiation monitoring is increasing in the fields of climate change, meteorology, solar energy and atmospheric physics. This requires the use of a sun tracker to measure the direct and the diffuse radiation components, and that complies with the WMO-GAW Baseline Surface Radiation Network (BSRN) requirements. Our 2AP sun tracker is widely used for this purpose because of its capabilities in extreme conditions around the world. However, for a number of users the 2AP is slightly over-specified. The new SOLYS 2 Sun Tracker from Kipp & Zonen provides BSRN level performance but is much easier to install and operate than any other tracker on the market.

A unique feature of SOLYS 2 is the integrated GPS receiver. After installation and levelling, the power is connected and the GPS automatically configures the location and time data. The tracker will move to the calculated sun position and simple mechanical adjustments are made to optimise the alignment. SOLYS 2 is the only fully automatic sun tracker available that does not require a computer and software for setup.

The rugged and distinctive cast aluminium housing has an integrated tripod stand with levelling feet and azimuth adjustment. Side plates with zenith adjustment and mountings for a Kipp & Zonen CH 1 pyrheliometer are included. For direct solar irradiation measurements it is only necessary to add a CH 1.

For convenient installation of up to three Kipp & Zonen global radiometers, a top mounting plate is available. This plate is included with the optional shading assembly, which has two adjustable shading balls for diffuse radiation measurements. By innovative design, ventilated or un-ventilated radiometers of different types can be accommodated without the need for adapters.

SOLYS 2 does not suffer from internal clock drift because the time is



regularly updated by the GPS receiver. If the tracker is correctly levelled and aligned it will continue to point accurately. An optional sun sensor is available for active tracking.

SOLYS 2 can operate from AC or 24 VDC power, both inputs are available as standard. The operating temperature range is  $-20^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$ , which can be extended to  $-40^{\circ}\text{C}$  with an optional heater (AC power only). The tracker will automatically restart after a power interruption and a tri-colour LED shows the operating status.

# SOLYS 2

SUNTRACKER

SOLYS 2 is designed for easy servicing, with all the electronics on the hinge-down rear panel. Stepping motors drive the shafts by long life toothed belts that do not require lubrication or adjustment and physical limit stops prevent over-rotation. An Ethernet port allows easy connection to a lap-top computer for testing, diagnostics or firmware updates via a web-browser interface.

SOLYS 2 brings to the sun tracker market distinctive design, innovative features, performance, quality and unprecedented ease of use – all at a surprisingly affordable price. The official launch is at the Annual Meeting of the European Meteorological Society in San Lorenzo de El Escorial, Spain on 1-5 October 2007. Please visit our website for more product information.







## Verifying Industrial Test Environments in Germany

In Germany, Kipp & Zonen radiation sensors have been used for meteorological purposes for over 50 years, but within the last 10 to 15 years their use in industrial test and measurement has been growing continuously. However, many industrial applications require measurements in environmental testing where the ambient temperature and the intensity of the radiation are considerably higher than in meteorology.

Therefore, a new high-temperature pyranometer (the CM 4) was developed in close cooperation with our industrial partners, in particular Steuernagel Lichttechnik. This pyranometer was launched in 2002 and ever since has been the sensor of choice for measurements in higher ambient temperatures. CM 4 has built-in temperature compensation and is constructed from materials suitable for operation from  $-40\text{ }^{\circ}\text{C}$  to  $+150\text{ }^{\circ}\text{C}$  with an irradiance of up to  $4000\text{ W/m}^2$  (compared to the power of  $1150\text{ W/m}^2$  normally received on the Earth). CM 4 is the world's most reliable pyranometer for measurements in such extreme temperatures.

Needless to say, other pyranometers from the CMP range are just as popular in German industry as the CM 4. The difference is that in this case the customers' main criterion is

not the temperature range but the accuracy. We at Gengenbach Messtechnik would like to share some examples of Kipp & Zonen sensors used in industry.

### Climate Chambers

Rail Tac Arsenal uses two climatic wind tunnels for testing rail and other large vehicles. Their largest tunnel is 100 m long with a 100 m preparation hall. It can simulate wind speeds of up to 300 km/h. All their tunnels can simulate snow, rainfall, high humidity, and tempera-



tures ranging from  $-50\text{ }^{\circ}\text{C}$  to  $+60\text{ }^{\circ}\text{C}$ . To simulate the effect of the sun, there is an artificial solar field consisting of 698 metal-halide lamps of 1500 W each, providing a radiating area of  $200\text{ m}^2$ .

### Sun Simulations

Solar simulation in climate chambers is mostly used for accelerated ageing or heat load tests, for example on complete vehicles, components or materials. For the simulation of global solar radiation in climate chambers, metal-halide lamps are normally used as the radiation sources. One of the main benefits of these lamps is their similarity to the



*Mr. Rolf Gengenbach, president of Gengenbach Messtechnik.*

spectral range of global solar radiation from 280 nm to 3000 nm.

The pyranometers serve as measuring devices to check or verify the light intensity (irradiance) at various positions within the given test environment as well as the spectral power distribution and its uniformity within a predefined reference area.

These are only two examples of the wide range of possibilities for Kipp & Zonen products in the industrial



market. Team Gengenbach specialises in providing comprehensive advice and information to customers, meeting their requirements and satisfying their needs. Positive feedback from our customers is the best argument to continue with our professional relationship.

*The pictures are provided by courtesy of Steuernagel Lichttechnik GmbH.*





## At the French Kipp & Zonen Office

France is renowned as one of the world's leading nations in scientific and industrial research. Therefore, Kipp & Zonen has its own office in the heart of France; Paris. With the trust and commitment of our customers, we have become the main provider of solar radiation measurement solutions for the meteorological and industrial sectors.

The management of air traffic in France is an example where Kipp & Zonen products are used. Météo France is one of our committed customers. They have started a new project to indicate fog density at airports with meteorological masts, using our pyranometers and pyrgeometers to measure incoming and reflected short-wave radiation together with downwards and upwards long-wave radiation.

Although the development of renewable energy in France is slow compared to the international trend, the interest is starting to grow. Our cooperation with the University of La Réunion Island indicates this growing interest. The island's unique geographical situation causes a large number of micro-climates, which are currently monitored with Kipp & Zonen solar radiation sensors and this has resulted in the decision to research and develop clean energy sources.

These are just two examples of projects from our French office. To



*Christine Laugier, Ben Dieterink & Kamal Sabra at the French office.*

see and experience more, we will be at your service at the Pollutec Exhibition in Paris, next November (27 - 30). We invite you to share your ideas with us and see our products and latest innovations.

Hope to meet you there!

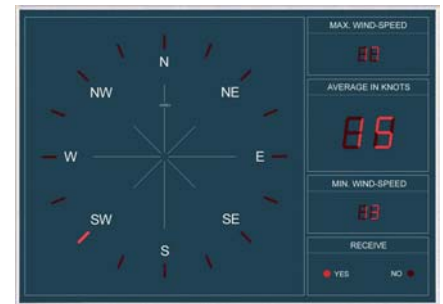
Christine Laugier & Kamal Sabra  
Kipp & Zonen France S.A.R.L



## Wind Data Transmitter System

In September 2007 Mierij Meteo commissioned a Wind Data Transmitter System for Norfolk Line B.V. Norfolkline provides ferry services between Rotterdam (NL) and Felixtowe (UK).

At the Port of Rotterdam a mast with Mierij Meteo wind sensors and a data transmitter system is installed. Every 10 seconds it transmits approx. 40 miles out over the North Sea the minimum, maximum and average wind speed and the wind direction.



*Wind Display model 2030-P*

Six operating vessels are equipped with Mierij Meteo receiver units and wind displays. When a vessel is within range, the current situation at the Port of Rotterdam will be received and displayed on the bridge. This enables the captain to take decisions for a safe approach to the port. Next year Norfolkline plans to install a Wind Data Transmitter System at the Port of Felixtowe.

Mierij Meteo has over 15 years experience with these kind of systems. P&O Ferries has transmitters at the Ports of Rotterdam, Zeebrugge, Hull and Middlesbrough with receiver units and displays on board 13 vessels.

For more information please contact Barry Engelen: [be@mierijmeteo.nl](mailto:be@mierijmeteo.nl)

## FAIRS & EVENTS

EMS Annual Meeting along with ECAM Conference	San Lorenzo de El Escorial (Spain)	01 - 05 Oct
International Horti Fair 2007	Amsterdam (The Netherlands)	09 - 12 Oct
20 <sup>th</sup> World Energy Congress	Rome (Italy)	11 - 15 Nov
4 <sup>th</sup> China International Exhibition on Technology & Equipment of Meteorology Science & Hydrology	Guangzhou (China)	23 - 25 Nov
Pollutec 2007	Paris (France)	27 - 30 Nov
AGU	San Francisco (USA)	11 - 15 Dec

# "Creative thinking ability, facilitates the ability to realize innovations"

(Emem Ite)

KNOWLEDGE

INNOVATION

PASSION

PERFORMANCE

## Innovation is one of our key values.

We believe that our strengths lie in the continuous development of innovative instruments and that this is why we are still at the top of the market today, after more than 175 years.

Through regular market research and our network of relations with customers, universities and research institutes we keep in touch with the market needs and demands. To respond to that 'need' we have a fully dedicated Research and Development department, with in-house production re-

sources, CAD system and test & calibration facilities.

Our recently developed CMP, CMA and CGR ranges of instruments, CNR2 net radiometer and the new SOLYS 2 sun tracker are some of our highly innovative pieces of work. In addition we invest in marketing and distributing cutting-edge equipment produced by specialised scientific companies; for example LIDAR systems, temperature profilers and sun photometers.

The market for solar and atmospheric measurement is constantly changing. To keep up with these changes we not only focus on the development of instruments, but also on the details that make our products unique. Such as helpful tools & accessories, integrated software and plug & play possibilities. More significantly Kipp & Zonen products can be recognised by their inherent quality and distinctive design.

KNOWLEDGE

INNOVATION

PASSION

PERFORMANCE

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