

## **Summary Scientific Section, Tuesday 12 August**

10 lectures were given, so we had a very busy day as you can read in this following abstracts.

### **Nilton Renno, USA, “Electric Sensor for Searching for Thermals Remotely”**

The electric field near the surface in fair weather conditions is of the order of 100-300 V/m around the globe. Thermals carry these charges upwards with the air rising from the surface forming modestly charged updrafts. The fact that thermals are charged allows them to be detected remotely with sensitive electric field sensors. The electric field sensor is so sensitive that it is capable of detecting them more than 1 km away. First measurements of thermals' electric fields with a miniature sensor mounted on the ground and in a Discus-2a sailplane have been done recently.

### **Roland Stuff, BRD, “Non-Viscous Vortex Generation due to Buoyancy, an example of application of compulsive forces in fluids”**

This very theoretical lecture showed the mathematical background, necessary to calculate vortices. The theory presented is applied to the interference between an aircraft wake and atmospheric instability. In this case a latent atmospheric instability may be triggered off by the aircraft wake. An example was given from a B747 with a significant downdraft calculated.

### **Olivier Liechti, Switzerland**

#### **1. “The phase diagram of soaring: flight mode transitions in combination of isolated and aligned lift patterns”**

In this paper the optimum cross-country speed of a glider is investigated which results from the climb rate when spiraling in isolated lift combined with gliding in patterns of aligned lift of a particular strength. By plotting the climb rate in isolated lift on one axis and the air mass vertical motion in aligned lift on the other axis isotach consists of two sections in terms of flight modes: dolphin and climb mode. The phase diagram of soaring flight modes is useful for flight planning if the climb rates in isolated and aligned lift can be predicted by meteorological models.

#### **2. “Meteorological predictions of updrafts in aligned patterns”**

In the second paper Olivier presented how to predict this combination of thermals and dynamic lifts. He used his well developed Top Task Competition tool and extended it to this kind of aligned updrafts. With this extension the simulated ground speed has improved significantly for flights he evaluated in some examples.

### **Edward Hindman USA, “Status of meteorological system for planing and evaluating glider flights in the northeast USA”**

Most gliders are equipped with GPS-flight recorders which store the position (x, y, z) as frequently as every 2-seconds. Further, the sinking speed of the glider as a function of forward speed is well-known. Consequently, these machines can be atmospheric probes; they can identify and measure regions of rising, sinking and horizontally moving air. Conversely, given predictions of the regions from a meso-scale numerical weather-prediction model, the glider can be ‘flown’ through the regions to predict the feasibility of a flight. Then, following the flight, the flight-recorder data can be compared with the predicted flight to help evaluate the weather predictions. Accordingly, a meteorological system consisting of the Regional Atmospheric Modeling System (RAMS) coupled with the glider flight algorithm TopTask Competition (TTC) was developed for Colorado USA and shown to be successful in predicting long-distance glider flights. Additionally, this study is a first-step toward an on-line glider pilot self-briefing system for the NE USA.

**Jörg Dumann, BRD, “A report on glider pilot activities to document leewave-events in northern Germany”**

Detailed studies about waves have been made especially in the area around the Harz, an isolated mountain in northern Germany. A special forecasting system motivates the pilots to use all promising conditions for wave flights. Every wave flight is recorded and available on the internet with additional comments of the pilots. This exchange of the experiences allows a better understanding of special phenomena. To gather more detailed meteorological information during the wave-flights a special logger was developed with several digital and analog ports available. Up to now we acquire temperature-, static pressure-, g-acceleration-data besides the position. Fortunately the logger is a product of a radio amateur volunteer group. The complete kit of the logger-system costs around 100,- Eur. Every year there is a meeting to discuss the phenomena and to exchange experiences between pilots and scientists.

**Zafer Aslan, Turkey, “ Analysis of Cloud cover and effects on thermal potential variation”**

The main aim of this paper is to analyse the climatologic variation effects on cloud cover and its role on thermal potential in selected areas in Turkey. It is reported that positive anomalies of North Atlantic Oscillations (NAO) resulted in decreasing trend of precipitation values in Eastern Mediterranean Area. Negative NAO anomalies accompanied by increasing precipitation values in and near vicinity of Turkey. To define the role of large scale effects like El Nino, La Nina and NAO, Wavelet Tools have been applied on different variables in recent years. This study covers 1D Wavelet packets and continuous wavelets on historical cloud cover values in North western and central parts of Turkey. Outputs of wavelet applications explain tele-connections between NAO and cloud cover variations and the role of this variation on thermal on the other word soaring potential of study area.

**Bahareh Bastanfard, Iran “ Analysis of the structure and dynamics of a surface frontal zone”**

For the first time we had a speaker from Iran. Bahareh is a student from Teheran and it was not easy for her to come to Lüsse. She presented a synoptic view of the detailed structure of a coldfront. Physical parameters in connection with different cases of fronts were shown. Also interesting frontogenetic and frontolytic effects were considered. She was accompanied by her friend, also a student Laleh.

**Laleh Shabrang, Iran “ Analysis of blocking and its effects on cyclogenesis over the Mediterranean”**

Laleh presented her studies about the processes of upper low developments over Mediterranean Sea. Interesting to hear, that this cyclones also have a significant influence so far to Teheran. A distinction of different synoptic features in connection with blocking effects were made. Besides the impressive and very good presentations it is interesting, that this two students found the Ostiv via Internet and did not know anything about gliding before. Triggered by the exchange of ideas, now they are thinking about to finish her studies somewhere in Europe.

**Beda Sigrist, Switzerland “ Identification of slope wind areas using topographic models”**

Beda was the last speaker of the day and the congress. He is the winner of the Ostiv-Diploma for his paper he presented 2006 in Eskilstuna. Based on the ideas of “TherMap” which indicates the “hot spots of updrafts in mountain areas he developed now a “WindMap”. The goal is to find out the best places for slope soaring conditions taking into account different wind directions. He uses high resolution models of the orography and defined windfields. His results

are in excellent agreement which was experienced by pilots during flights. In the next step he will try to get the windfield from model output and then he will get a very promising tool of "Slope wind forecasts".