The Soaring Meteorology Course of the Ludwig-Maximilians Universität at Coburg-Steinrücken

Richard Heinrich, Dieter Heimann, Heinz Lösslein,
Günter Müller, Matthias Brehm
… many many others …
Sabine Rieß, Hilbert Wendt, Maximilian Dollner, Maximilian Rose
Bernadett Weinzierl, Markus Garhammer, Martin Hagen

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Messerschmitt Flugsportgruppe, Manching
Flugsportgruppe DLR, Oberpfaffenhofen
Institut für Physik der Atmosphäre, DLR, Oberpfaffenhofen

The Course

- “The Event” during the study of Meteorology at the University of Munich
- Scheduled for Bachelor students in context with courses on synoptic meteorology
- Training in:
  - Analysis of weather charts
  - Weather observations
  - Aerological measurements with radiosonde and pilot balloons
  - Preparation and presentation of soaring forecasts
  - additional measurements like aerosol measurements
- 10 days during end of July / beginning of August

Photo: Sabine Rieß

How it started

- In the 1980's Aeronautical measurement course organized by Carl Freytag, Barbara Hennemuth, Manfred Reinhardt at DFVLR Oberpfaffenhofen

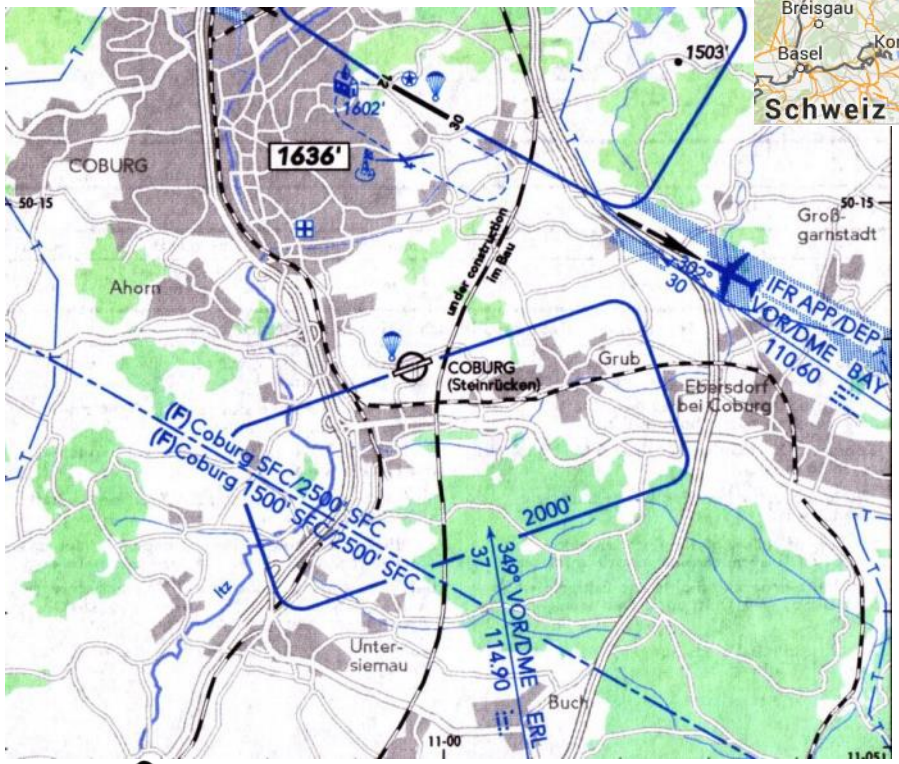
- 1986 first course at Coburg-Steinrücken airfield organized by
  Ritschie Heinrich, Dieter Heimann, Günther Müller, Heinz Lösslein, Matthias Brehm

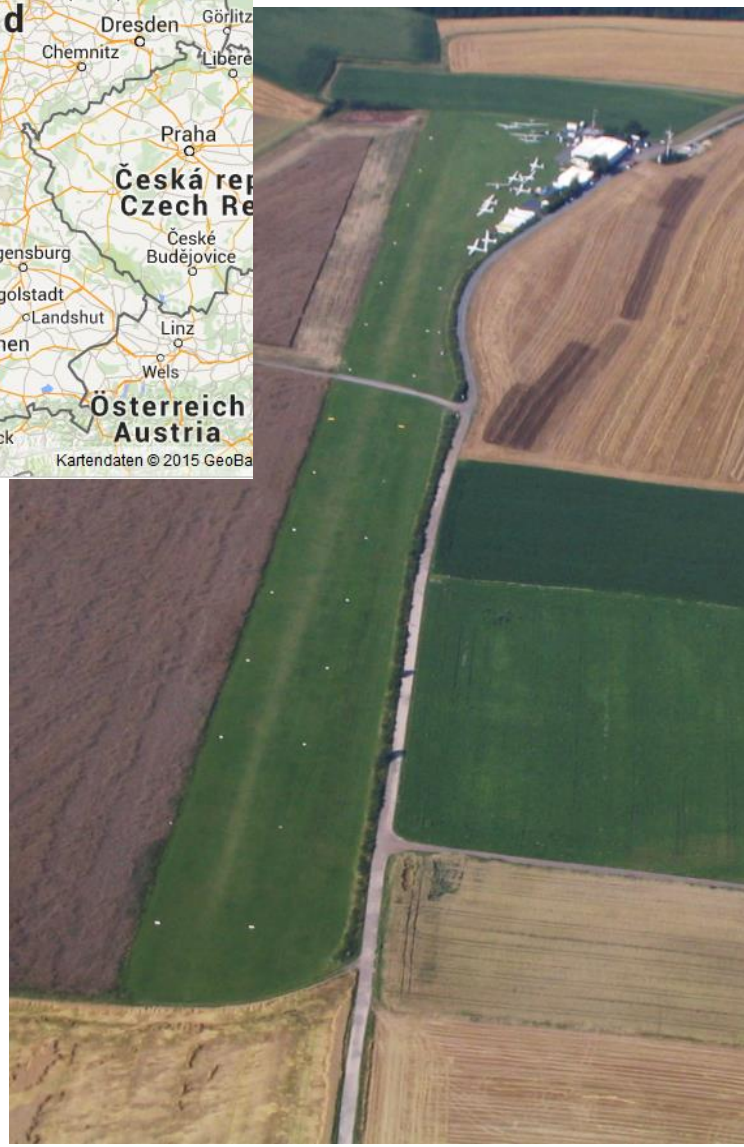
  SPASS
  Segelflugmeteorologisches **P**raktikum **a**uf **S**teinrücken im **S**ommer 1986

- since then every 2 years for 10 days during end of July / beginning of August

The Course

- Coburg-Steinrücken, EDQY airfield in northern Bavaria
- 700 m grass runway
- aircraft towing for gliders





The Course

- 20 Students divided in 4 groups
- about 10 supervisors
- about 20 pilots from
  - Flugsportgruppe Messerschmitt Manching
  - Flugsportgruppe DLR Oberpfaffenhofen
  - performing
    - soaring flights with students
    - aero-towing of gliders
    - measurements of temperature and humidity profile
    - acrobatic glider flights

Photo: Sabine Rieß

The Course

- Day 1: arrival

- Day 2-5:
  Training of students in 4 rotating groups:
  - Weather observations and pilot balloons
  - Temp analysis and gliding forecast
  - Synoptic analysis and weather forecasts
  - Logistics: preparation of meals, cleaning, …

- Day 6: day off
  “Gala Dinner” prepared by supervisors

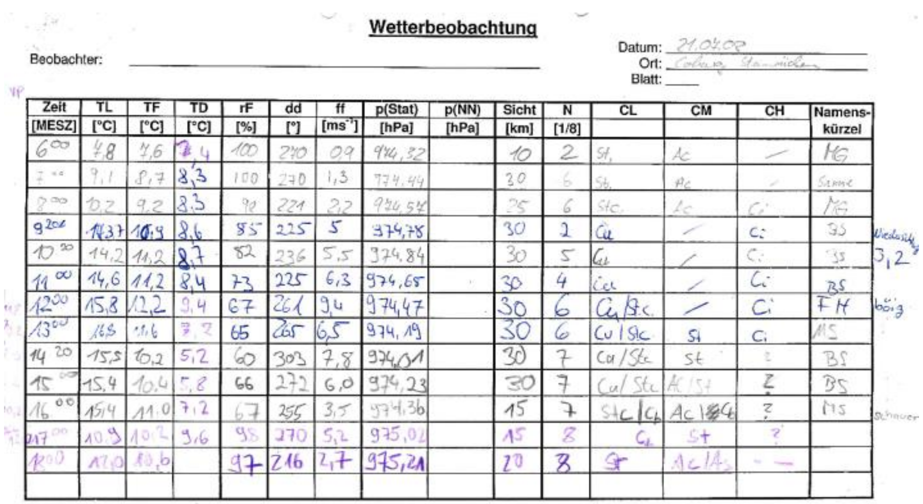
- Day 7-10: Training of students in 4 rotating groups with reduced support by supervisors

- Day 11: cleaning of airfield and departure

Time (lcl)	Activity
6:00	Begin of observations sun-rise temp-flight
7:30	Breakfast
8:00 – 11:00	Group activity temp-flights
11:00 – 12:00	Briefing, forecasts
12:00 – 13:00	Lunch
13:00 – 18:00	Group work temp-flights
18:00	De-briefing, forecasts
19:00 – …	Dinner, leisure

Observation and Pilot Balloon Group

- Hourly observations of the weather situation



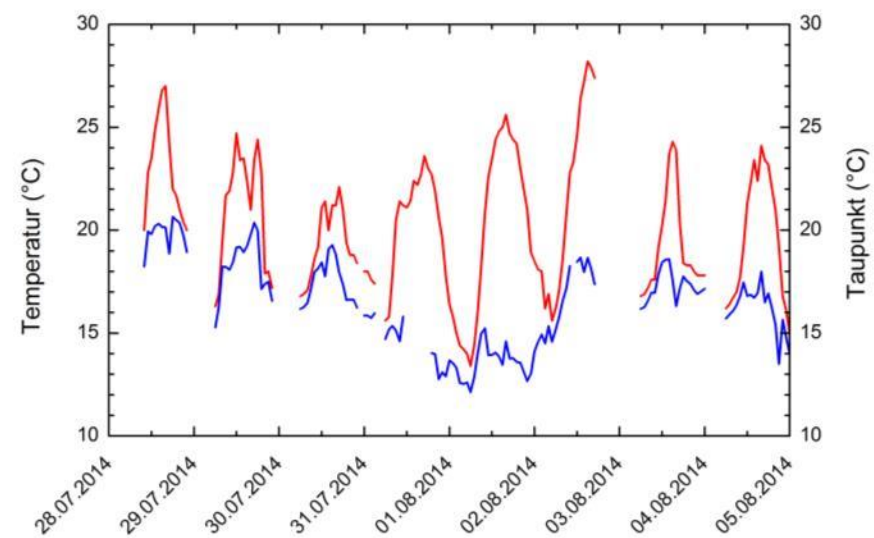
Wetterbeobachtung

Beobachter: ______

Datum: 21.07.08
Ort: Coburg Steinrücken
Blatt: ___

Zeit [MESZ]	TL [°C]	TF [°C]	TD [°C]	rF [%]	dd [°]	ff [ms⁻¹]	p(Stat) [hPa]	p(NN) [hPa]	Sicht [km]	N [1/8]	CL	CM	CH	Namens-kürzel
6⁰⁰	7,8	7,6	7,4	100	270	0,9	974,32		10	2	St	Ac	—	MG
7⁰⁰	9,1	8,7	8,3	100	270	1,3	974,44		30	6	St	Ac	—	Sanne
8⁰⁰	10,2	9,2	8,3	90	221	2,2	974,57		25	6	Stc	Ac	Ci	MG
9²⁰	14,3	10,9	8,6	85	225	5	974,78		30	2	Cu	—	Ci	BS
10²⁰	14,2	11,2	8,7	82	236	5,5	974,84		30	5	Cu	—	Ci	BS
11⁰⁰	14,6	11,2	8,4	73	225	6,3	974,65		30	4	Cu	—	Ci	BS
12⁰⁰	15,8	12,2	9,4	67	261	9,4	974,47		30	6	Cu/Stc	—	Ci	FH
13⁰⁰	16,5	11,6	7,2	65	265	6,5	974,19		30	6	Cu/Stc	St	Ci	MS
14²⁰	15,5	10,2	5,2	60	303	7,8	974,01		30	7	Cu/Stc	St	?	BS
15⁰⁰	15,4	10,4	5,8	66	272	6,0	974,23		30	7	Cu/Stc	Ac/St	?	BS
16⁰⁰	15,4	11,0	7,2	67	255	3,5	974,36		15	7	Stc/Cb	Ac/Cb	?	MS
17⁰⁰	10,9	10,2	9,6	98	270	5,2	975,02		15	8	Cb	St	?	
18⁰⁰	11,0	10,6		97	216	2,7	975,21		20	8	St	Ac/As	—	

Böenspitze 13,2 · böig · Schauer



DLR
LMU LUDWIG-MAXIMILIANS-UNIVERSITÄT MÜNCHEN
FAKULTÄT FÜR PHYSIK METEOROLOGIE
MIM

Observation and Pilot Balloon Group

- Measurement of wind profiles by tracking of balloon with two theodolites

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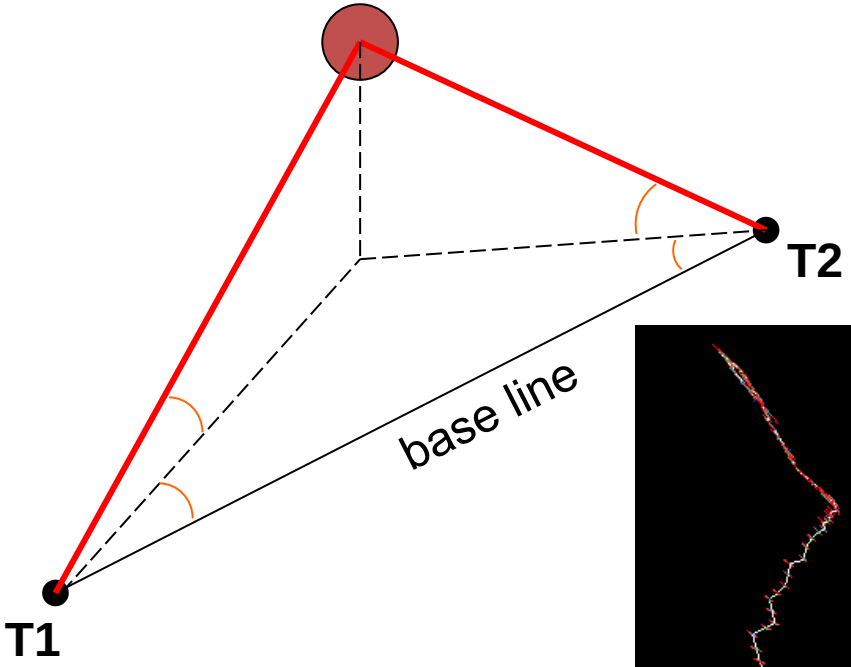
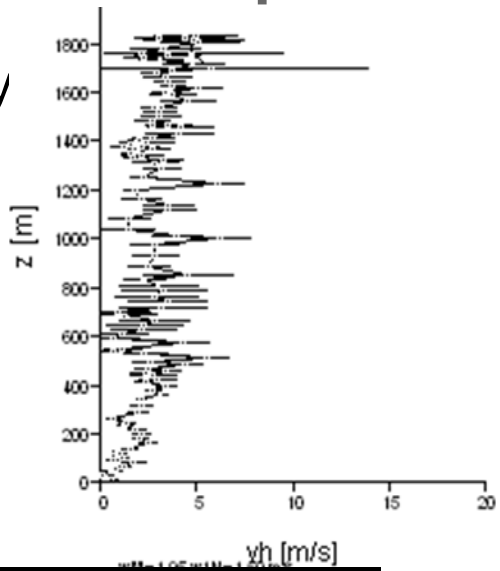
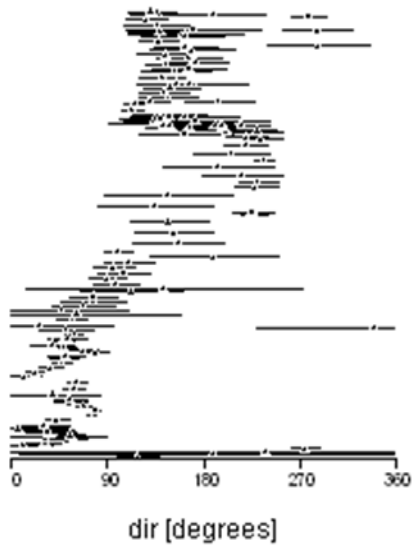
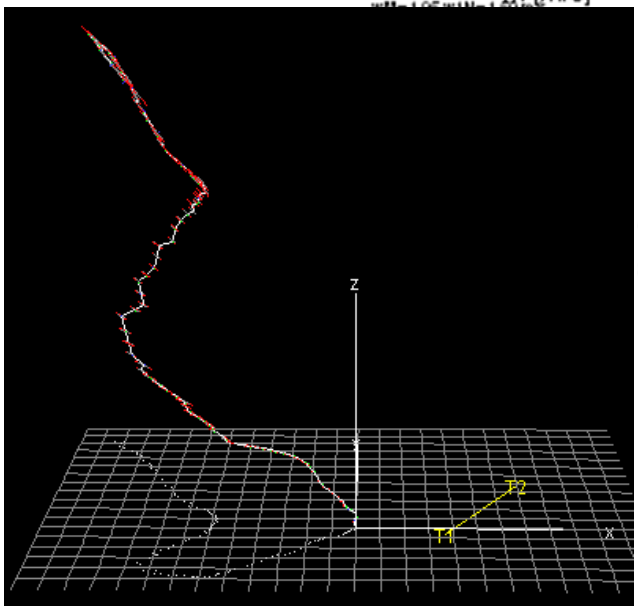
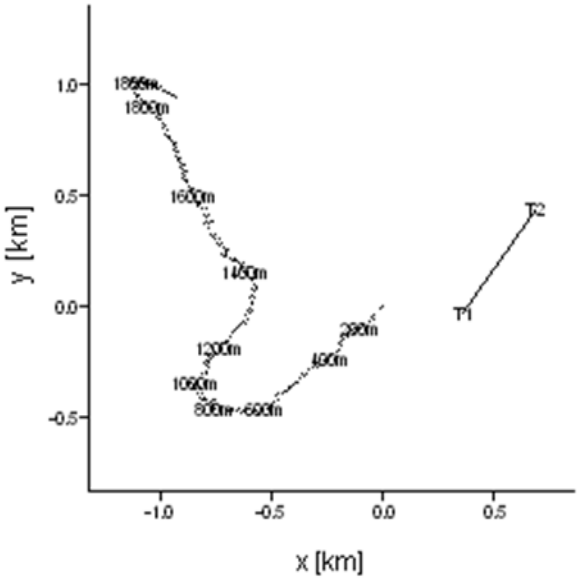




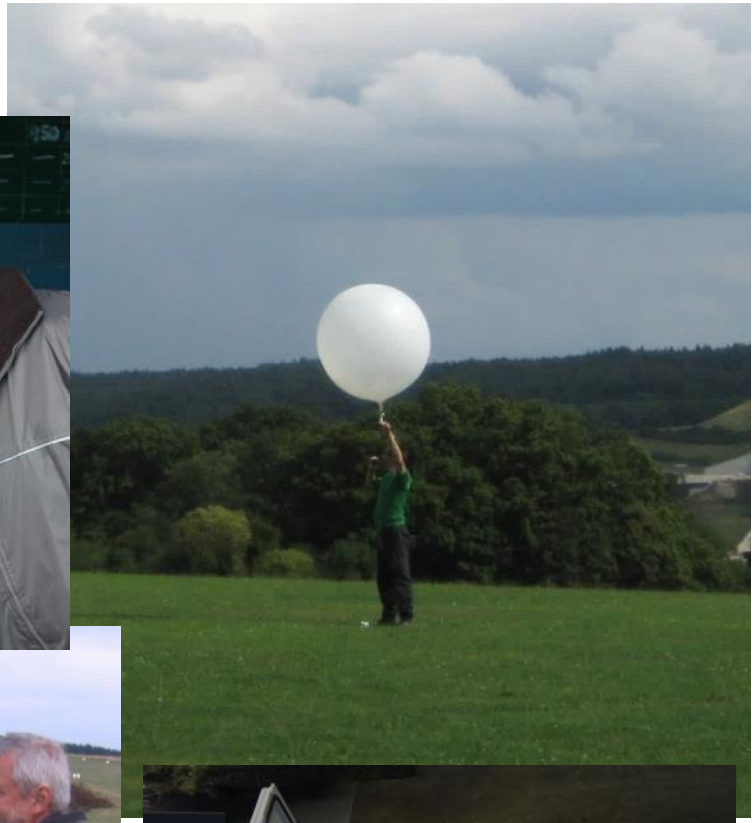


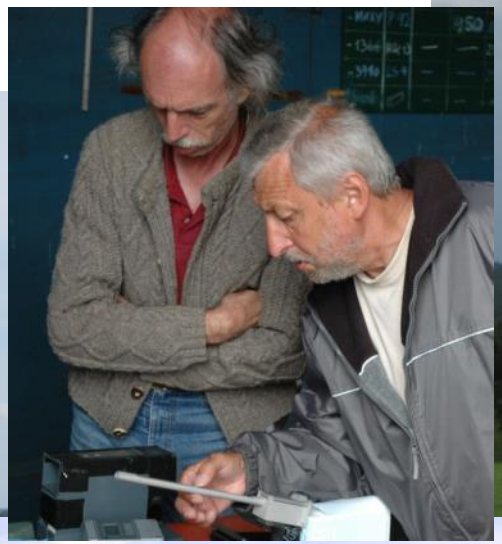




Observation and Pilot Balloon Group

- Launch of radio sonde, daily at 12 UTC
  Vaisala RS92 (RS80)



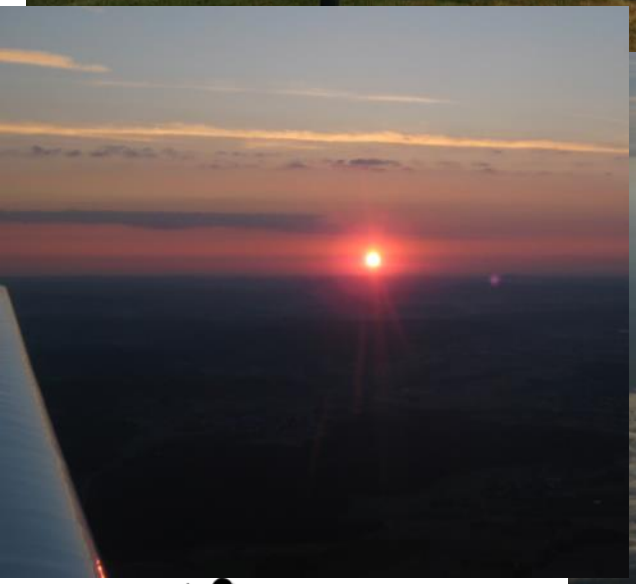


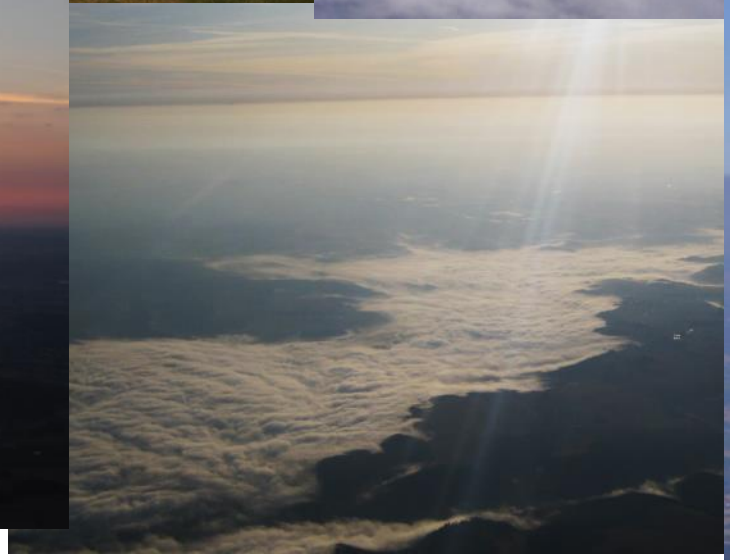
Temp Analysis and Soaring Condition Forecast

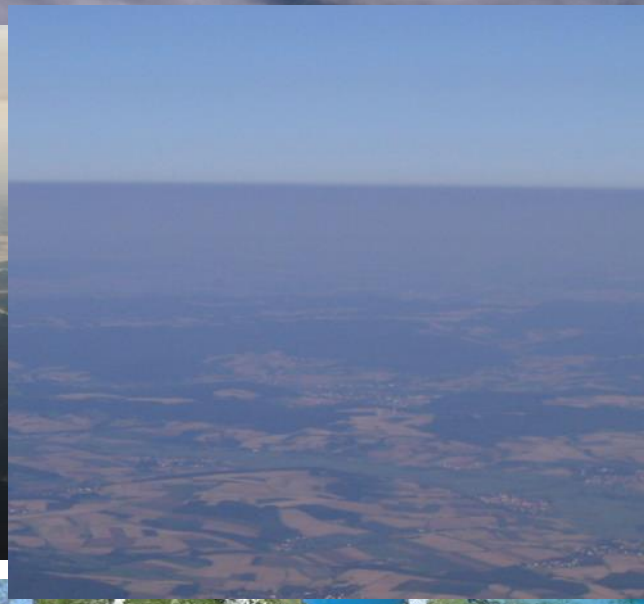
- Measurement of temperature and humidity profiles with aircraft
  - ground (360 m MSL) up to 3000 m (10000 ft, 700 hPa) maximum height for VFR flights (~ ceiling of ASK 16)
  - about 4 times per day
  - psychrometer (dry and wet-bulb electronic temperature sensor) and pressure sensor, manuell recording every 10 hPa
  - automatic recording (after 2009)

Temp Analysis and Soaring Condition Forecast

- Temp flights with ASK-16 and DA-20

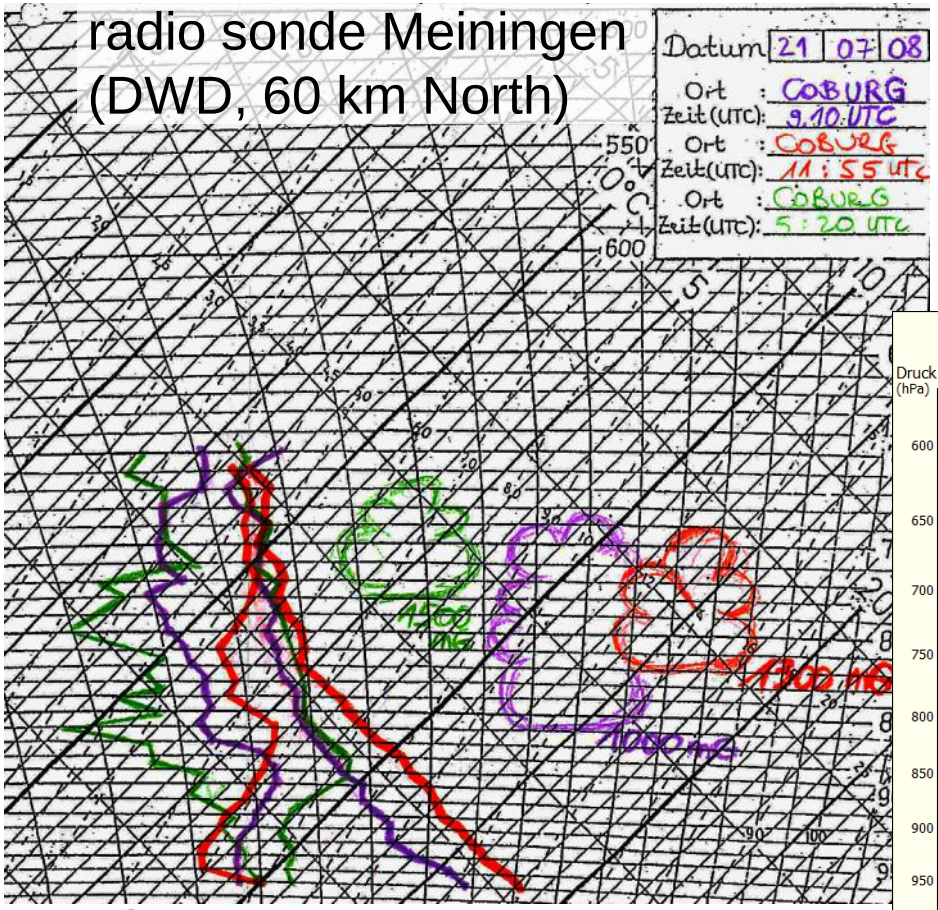


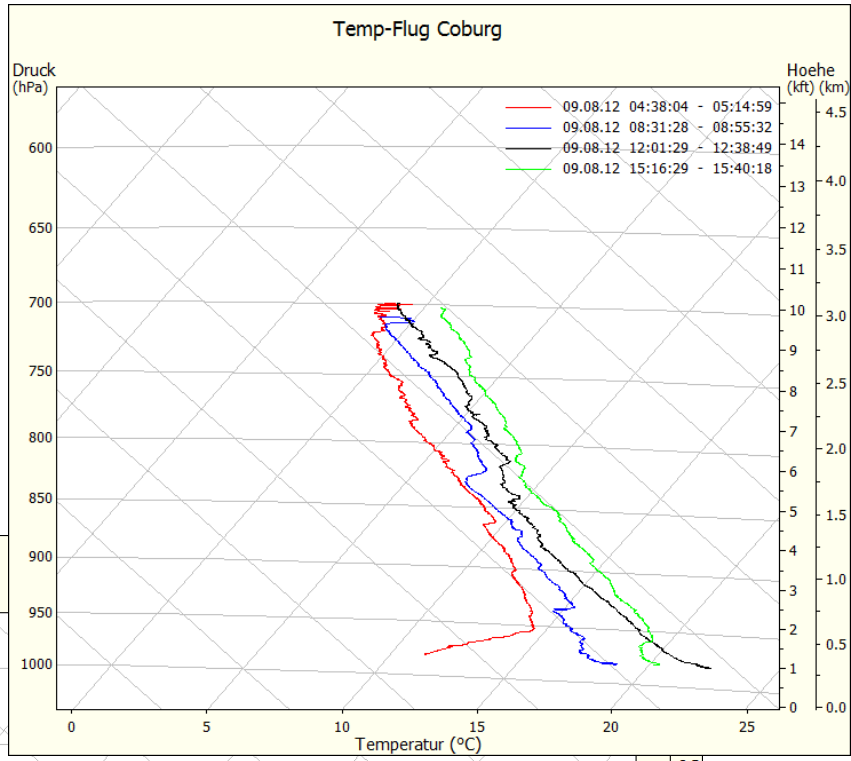


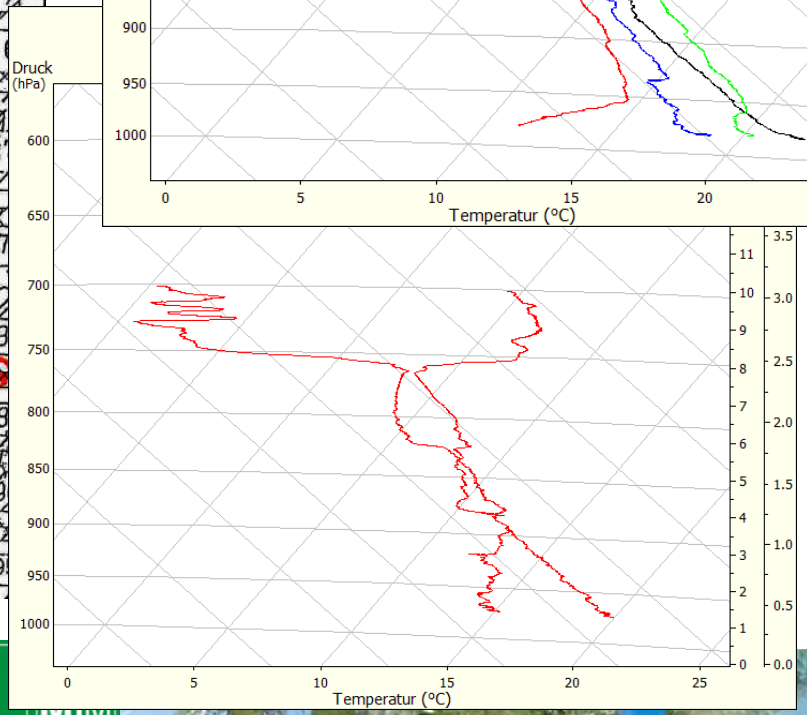


Temp Analysis and Soaring Condition Forecast

- Analysis of profiles (manually), supervised by Ritschie Heinrich
  Temp-flights, radio sonde Coburg, radio sonde Meiningen (DWD, 60 km North)

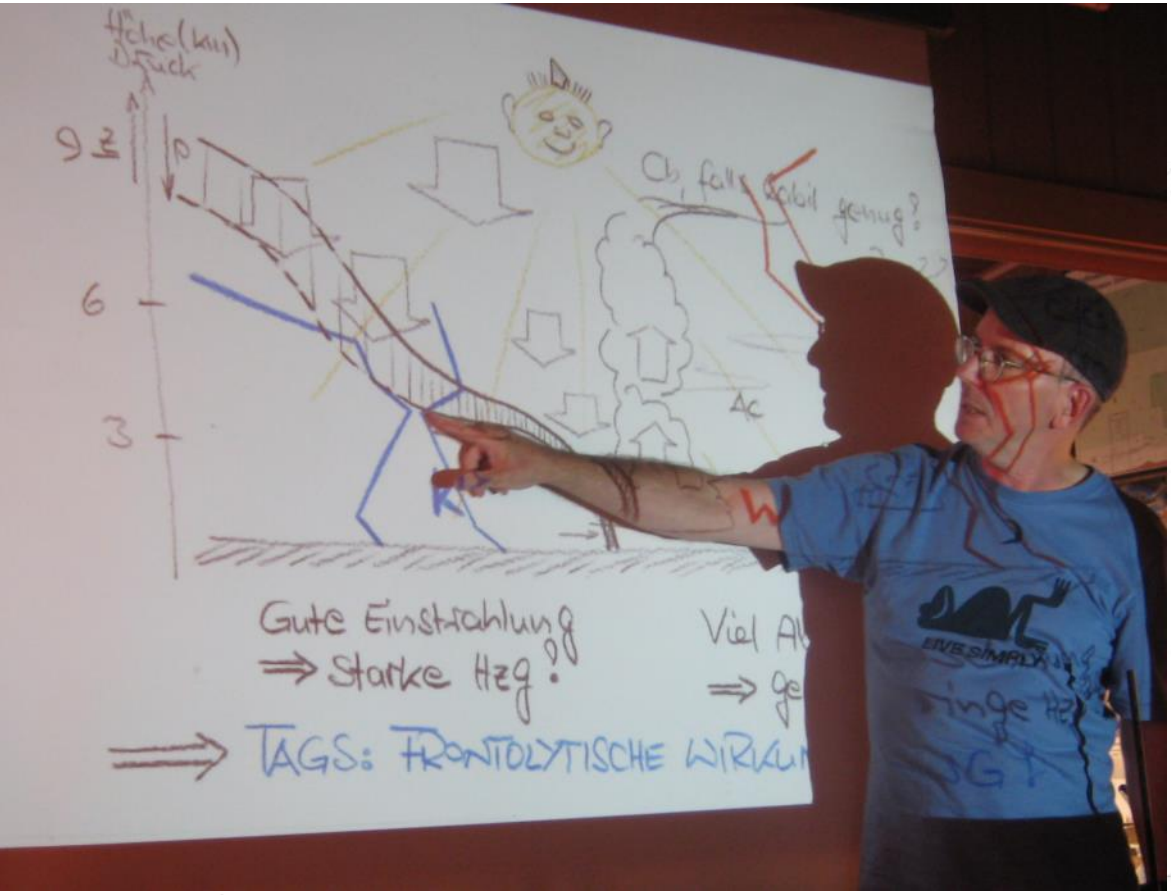


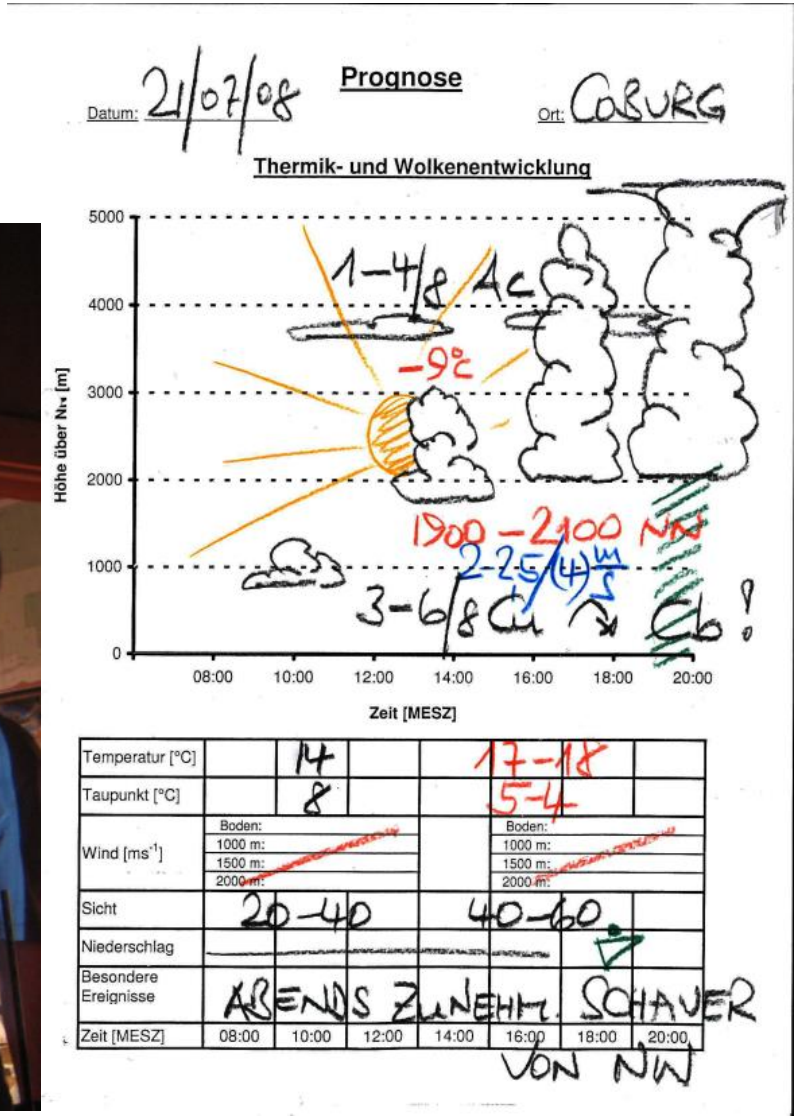




Temp Analysis and Soaring Condition Forecast

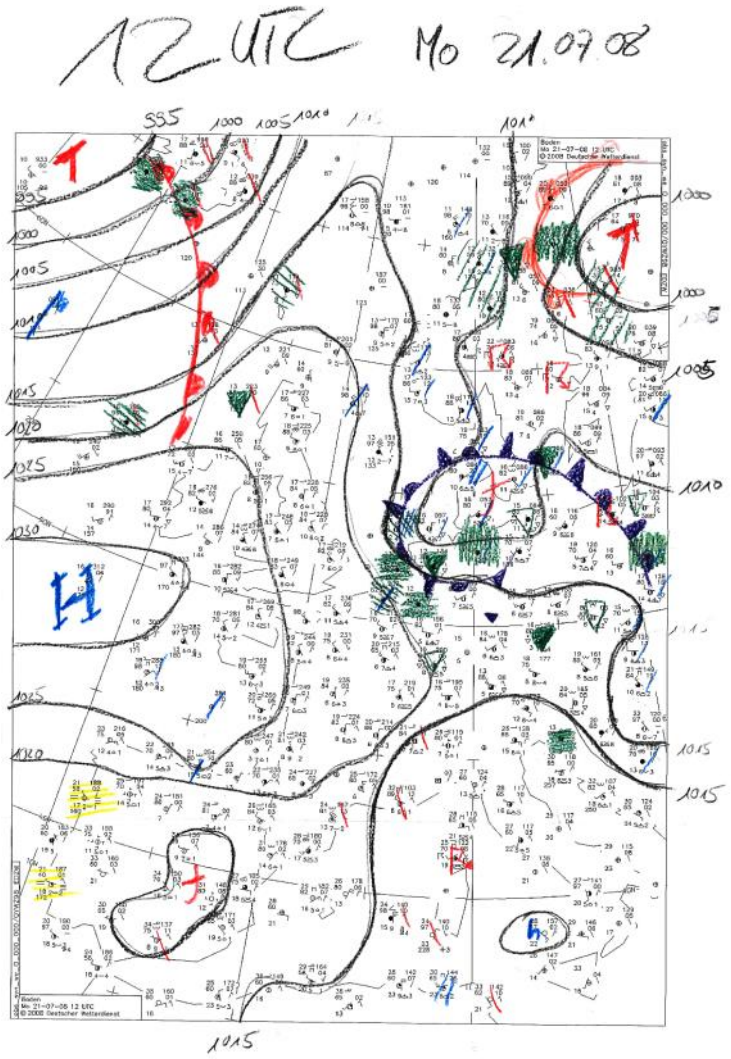
- Analysis and Forecast





Synoptic Analysis and Weather Forecasts

- Analysis of surface charts and DWD forecasts



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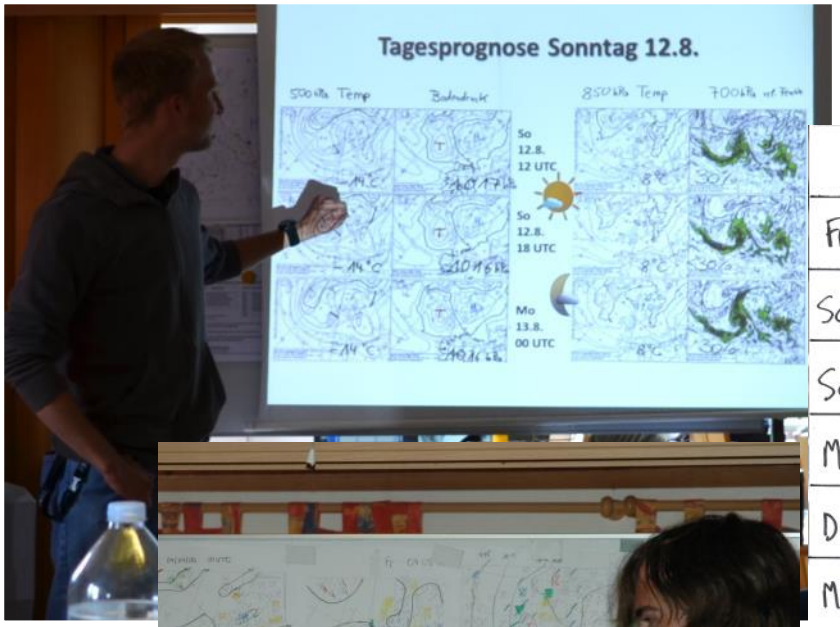

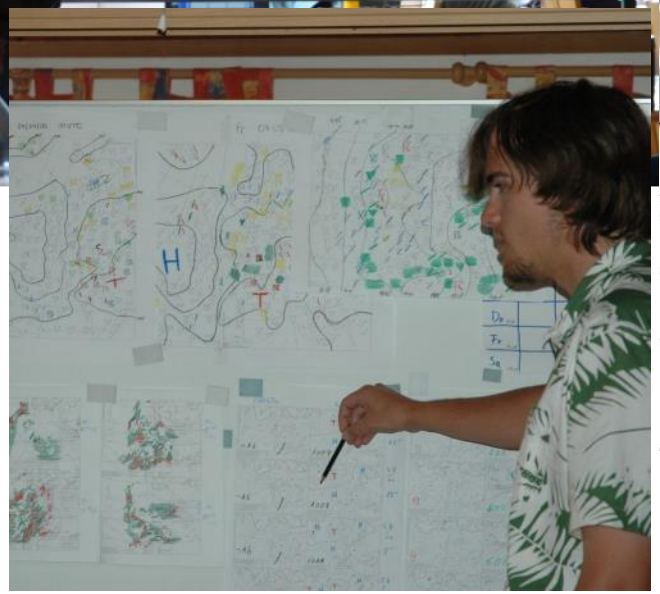

Forecast for ➔

↓ Forecast from	Fr	Sa	So	Mo	Di	Mi	Do	Fr	Sa	So
Fr										
Sa										
So										
Mo										
Di										
Mi										
Do										
Fr										
Sa										

Support and Logistics Group

- Preparing breakfast, lunch and dinner in small kitchen for 50 persons

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Flying Experience for Students

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