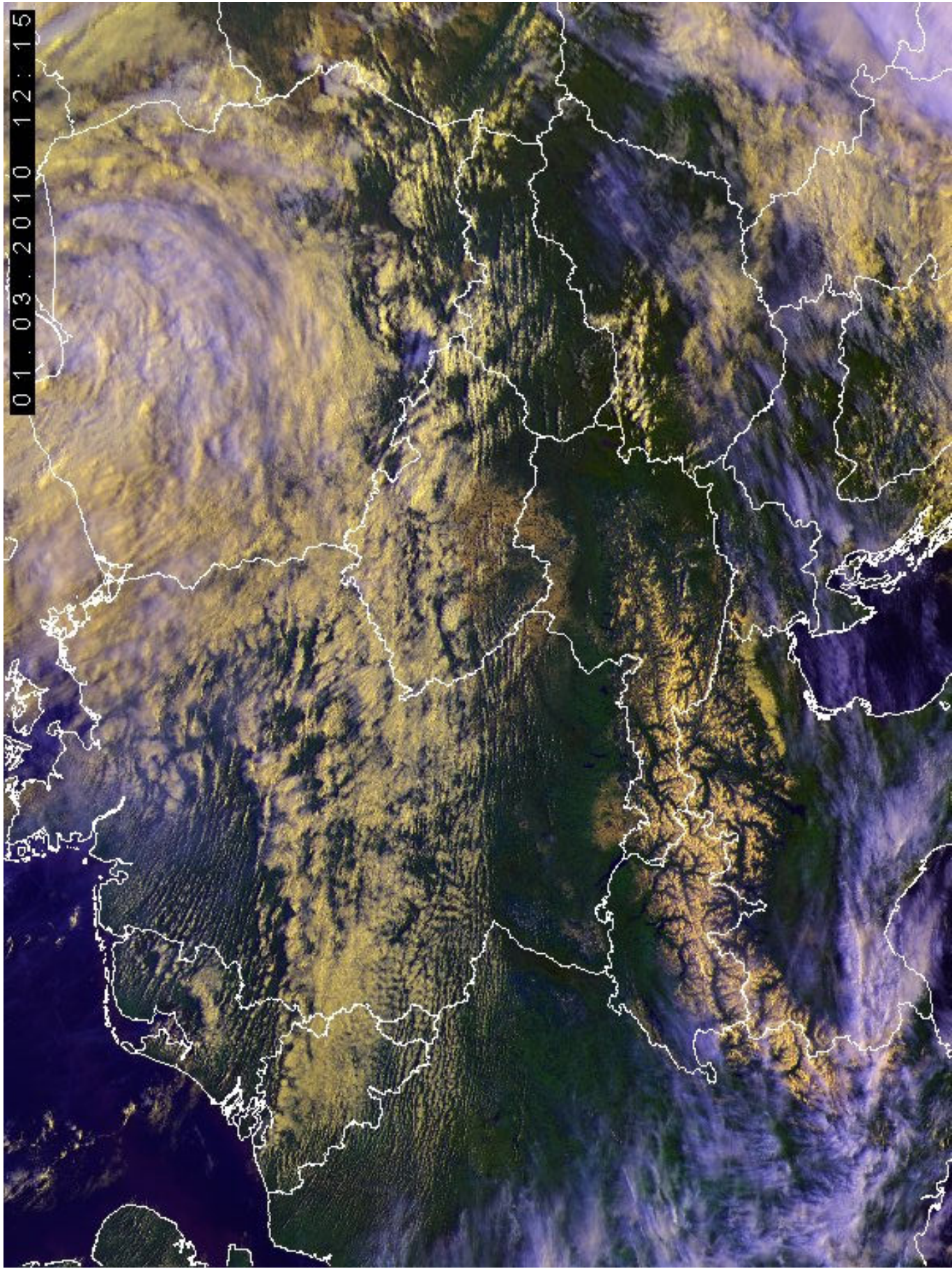


Wellen und Wolkenstrassen

Kriterien Wind ?
Scorerparameter?

Wolkenstraßen und Wellen am gleichen Tag

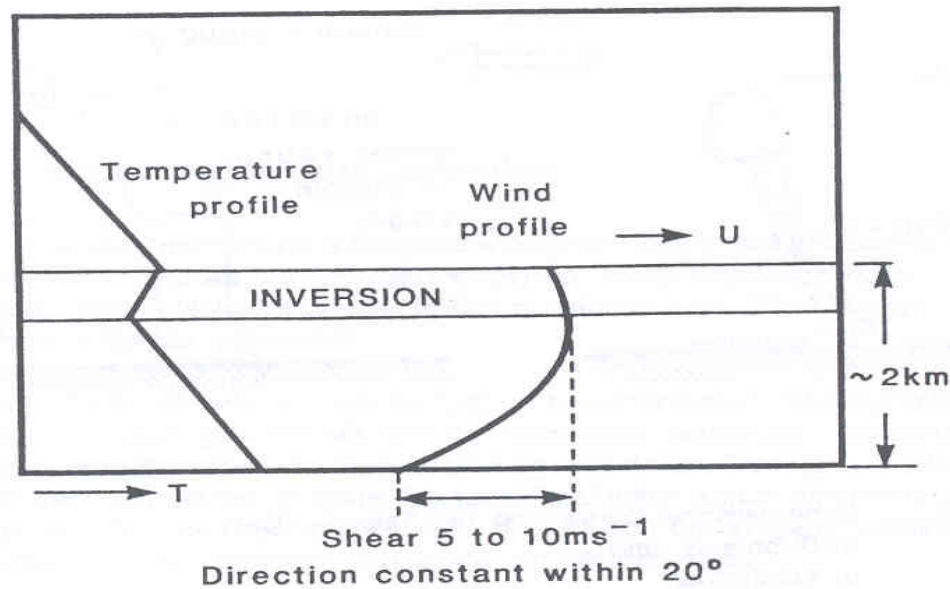
- **1. März 2010**
- **17. März 2009**



Wolkenstraßenkriterium – gekrümmtes Windprofil und Inversion

Abbildung 2.38

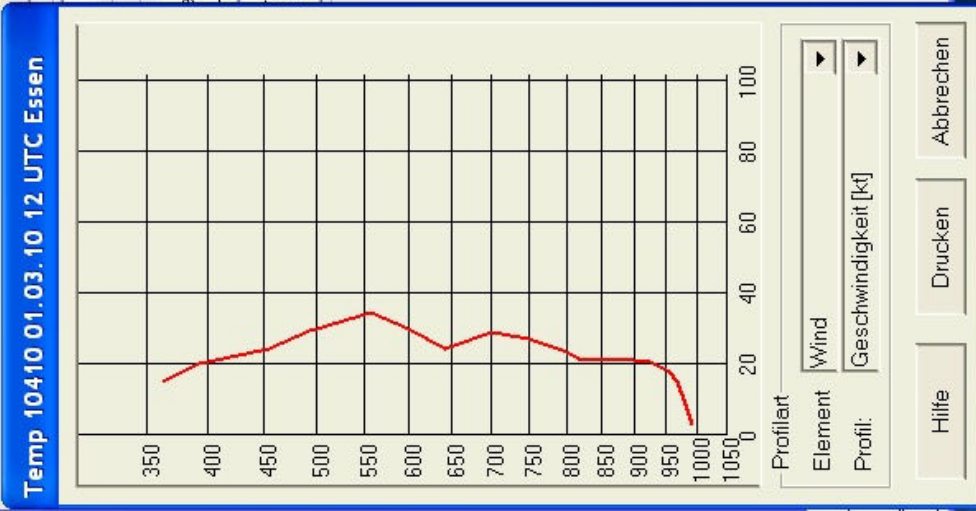
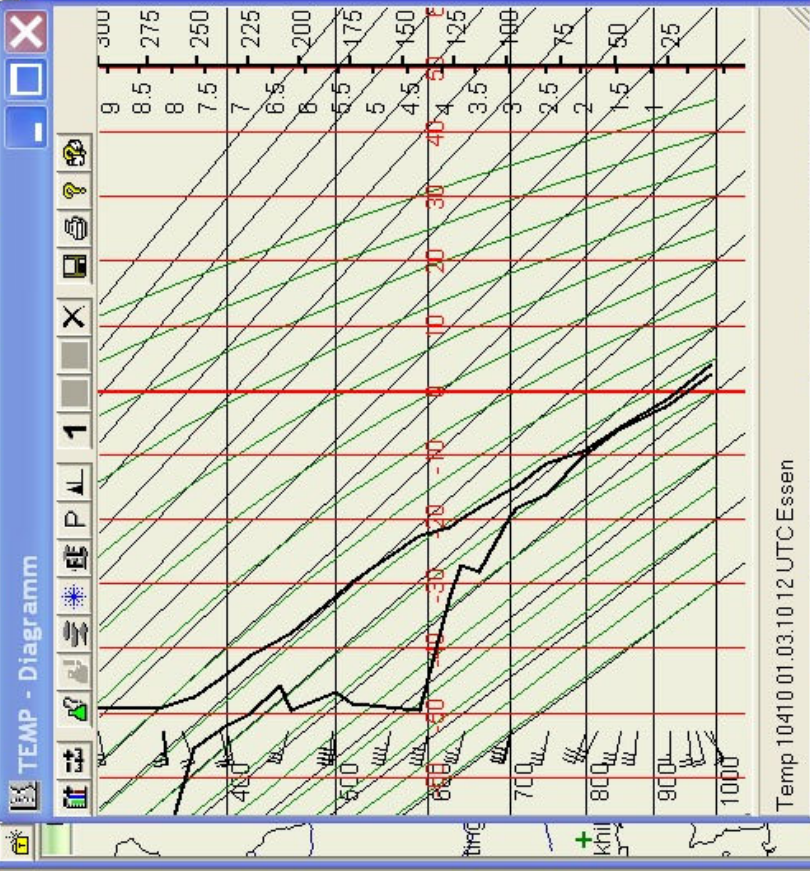
Profile von Temperatur und Windgeschwindigkeit bei Wolkenstraßen



Ein strenges Kriterium



TEMP - Übersicht : : Meldungen vom 01.03.2010, 12 UTC

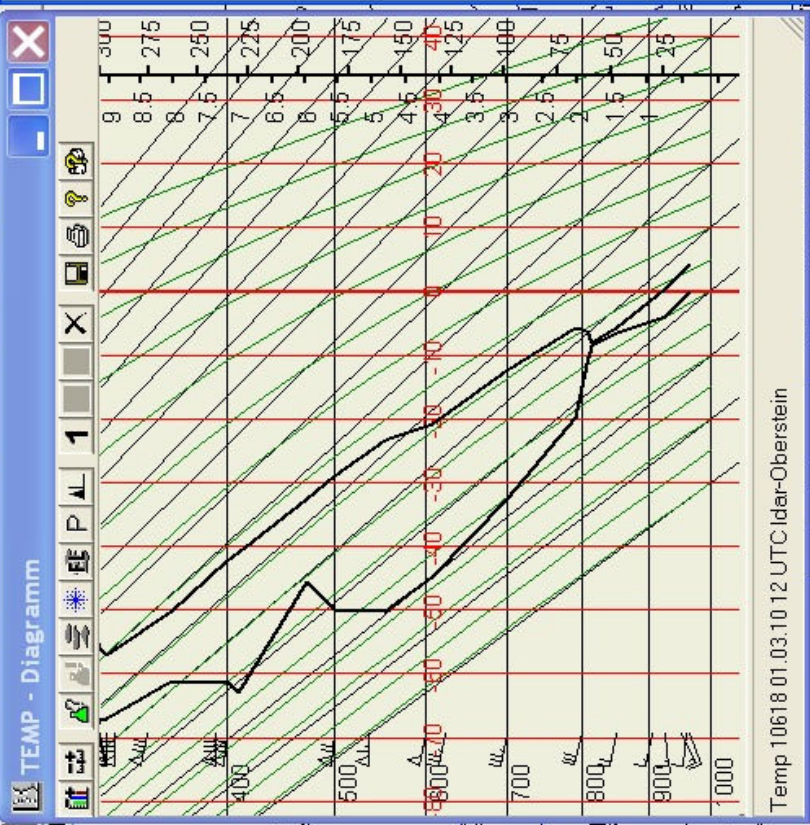


| | | |
|-----------------|------------------|-------------------|
| Temperaturpunkt | Konvektion | Taupunktdifferenz |
| Windrichtung | Relative Feuchte | Schichtwolken |

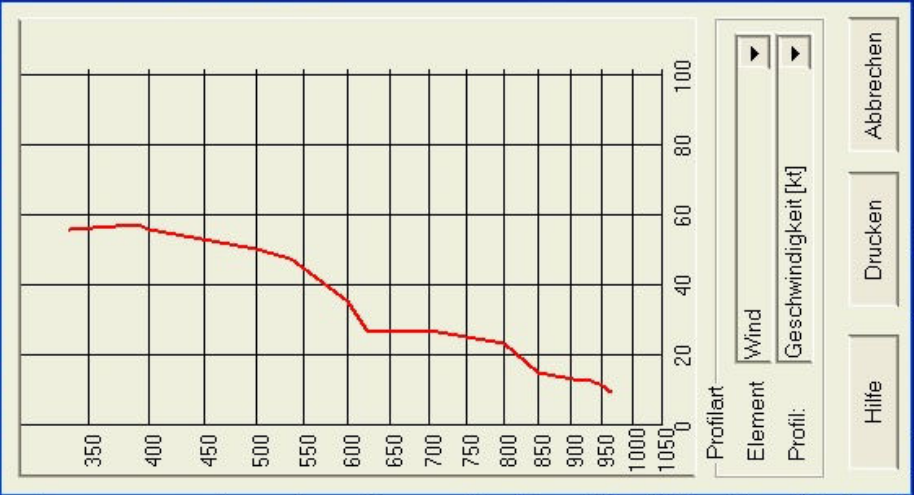
TEMPs
insichtete Produkt aus:



TEMP - Übersicht : : Meldungen vom 01.03.2010, 12 UTC



Temp 10618 01.03.10 12 UTC Idar-O...



| | | | |
|-----------------|------------------|-------------------|---------------|
| Temperaturpunkt | Konvektion | Taupunktdifferenz | Schichtwolken |
| Advektion | Relative Feuchte | | |

TEMPs

insichtete Produkt aus:

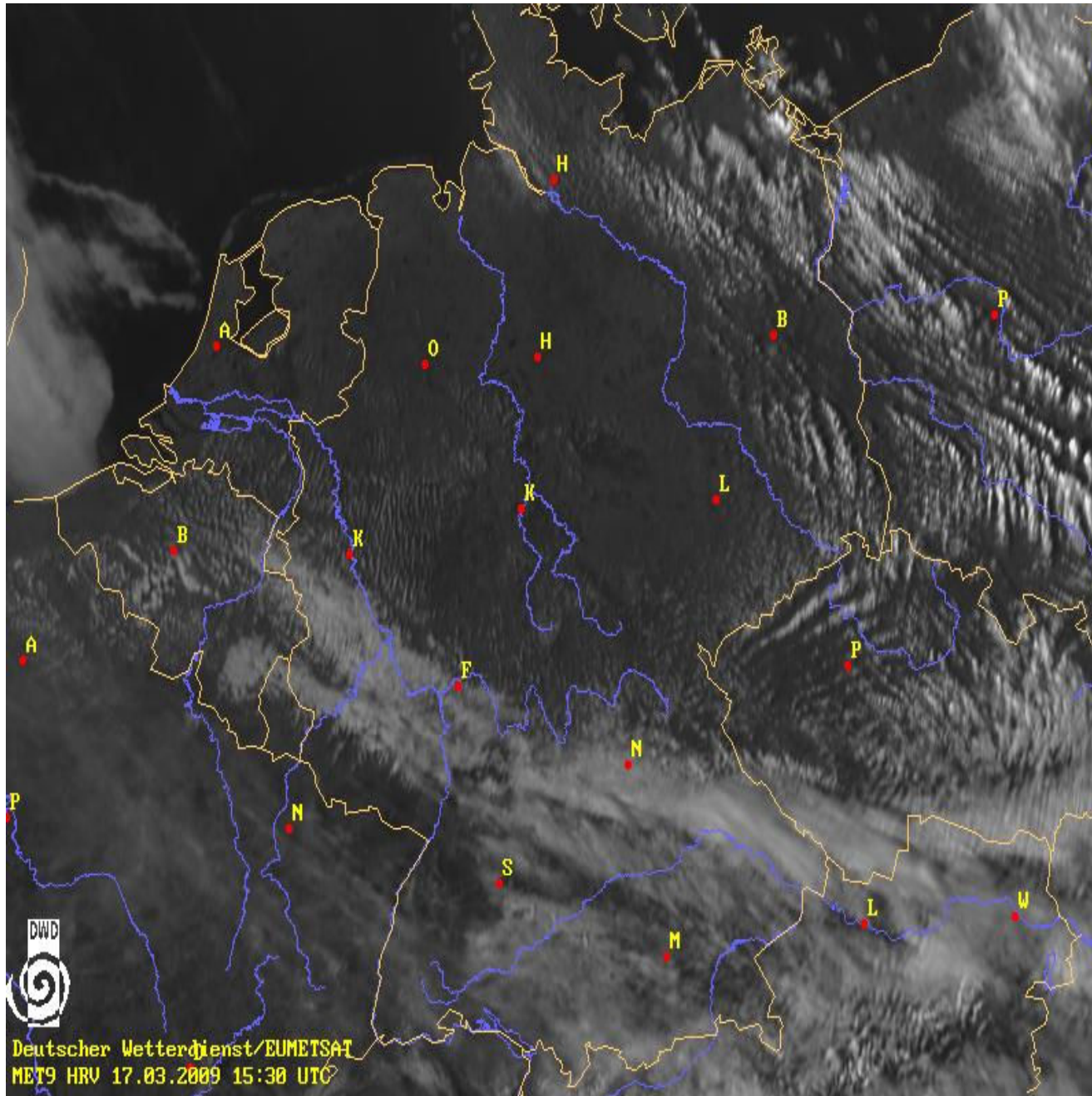
lle



Es ist ein...
verfügbar...
Aktualisierung

Wolkenstrassenkriterien

- **Gekrümmtes Windprofil – Windmaximum innerhalb der Konvektionsschicht und einer Inversion darüber (nach Kuettner 1959)**
- **In den Messungen (Sondierungen – seltener am gleichen Ort) werden zu etwa 20% Windzunahmen mit der Höhe angetroffen (ohne Krümmung) und auch thermische Schichtungen ohne Inversion**
- **Auch eine Inversion ist nicht immer vorhanden**



Nordwestströmung:

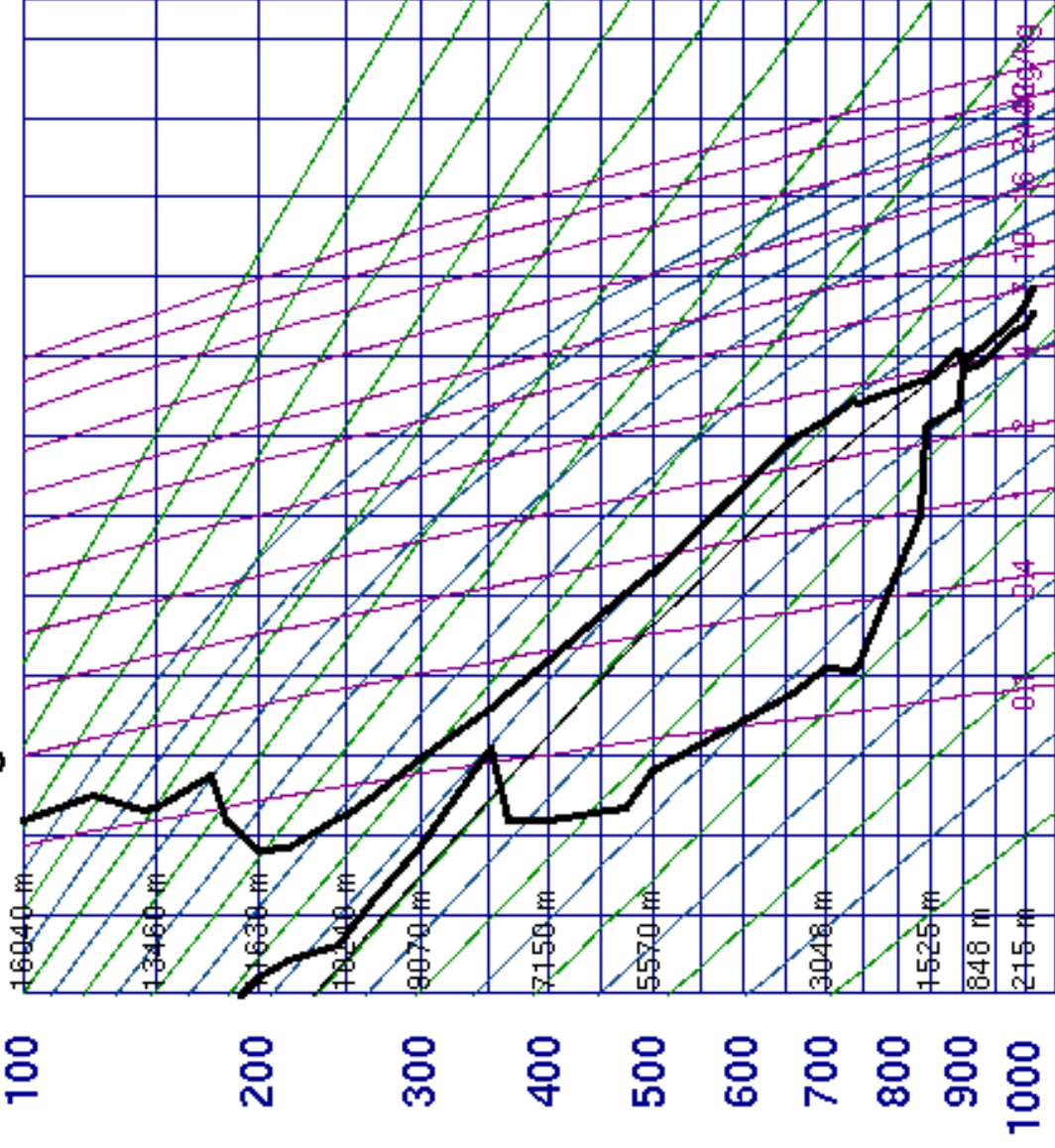
**Wolkenstrukturen
Wie zu erwarten,**

**Leewellen hinter den
Bergen und Wolken-
strassen**

Kriterien

- Die Kriterien für Wellen und Wolkenstrassen scheinen erfüllt
- Hier erscheint nur die Orographie das Unterscheidungsmerkmal zu sein
- Welche Bedeutung haben die vertikalen Wärmeströme ?

10393 Lindenberg

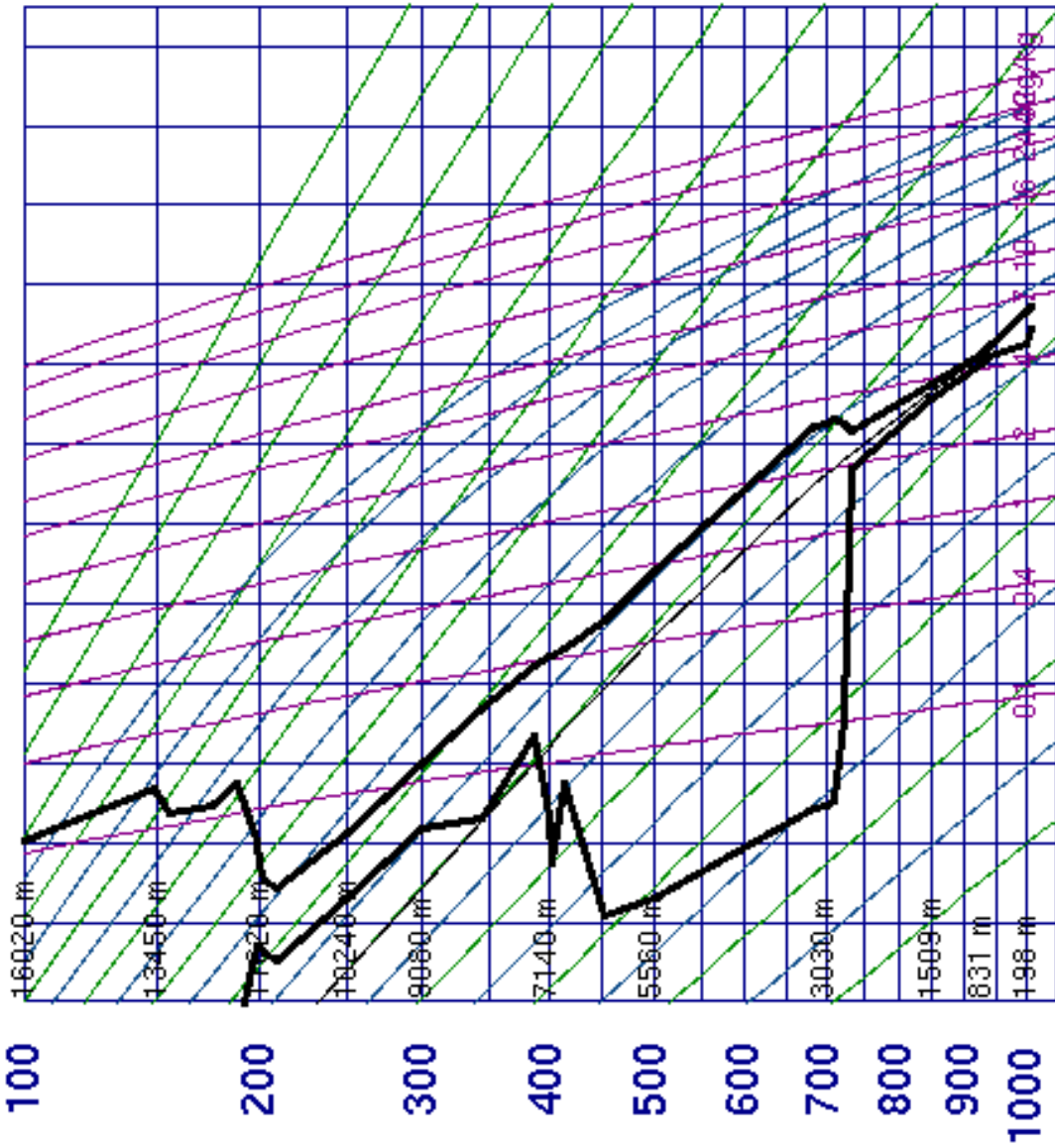


-80 -70 -60 -50 -40 -30 -20 -10 0 10 20 30 40

12Z 17 Mar 2009

University of Wyoming

12425 Wrocław I



-80 -70 -60 -50 -40 -30 -20 -10 0 10 20 30 40

12Z 17 Mar 2009

University of Wyoming

| | |
|------|-------|
| SLAT | 51.78 |
| SLOH | 16.88 |
| SELV | 122.0 |
| SHOW | 8.12 |
| LIFT | 8.22 |
| LFTV | 8.15 |
| SWET | 132.0 |
| KINX | -29.0 |
| CTOT | 21.50 |
| VTOT | 23.40 |
| TOTL | 44.90 |
| CAPE | 0.00 |
| CAPV | 0.00 |
| CINS | 0.00 |
| CINV | 0.00 |
| EQLV | -9999 |
| EGTV | -9999 |
| LFCT | -9999 |
| LFCV | -9999 |
| BRCH | 0.00 |
| BRCV | 0.00 |
| LCLT | 274.7 |
| LCLP | 936.5 |
| MLTH | 279.9 |
| MLMR | 4.61 |
| THCK | 5362. |
| PWAT | 10.01 |

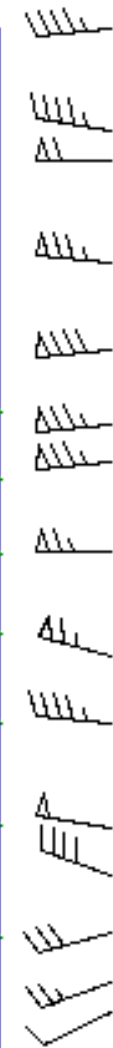
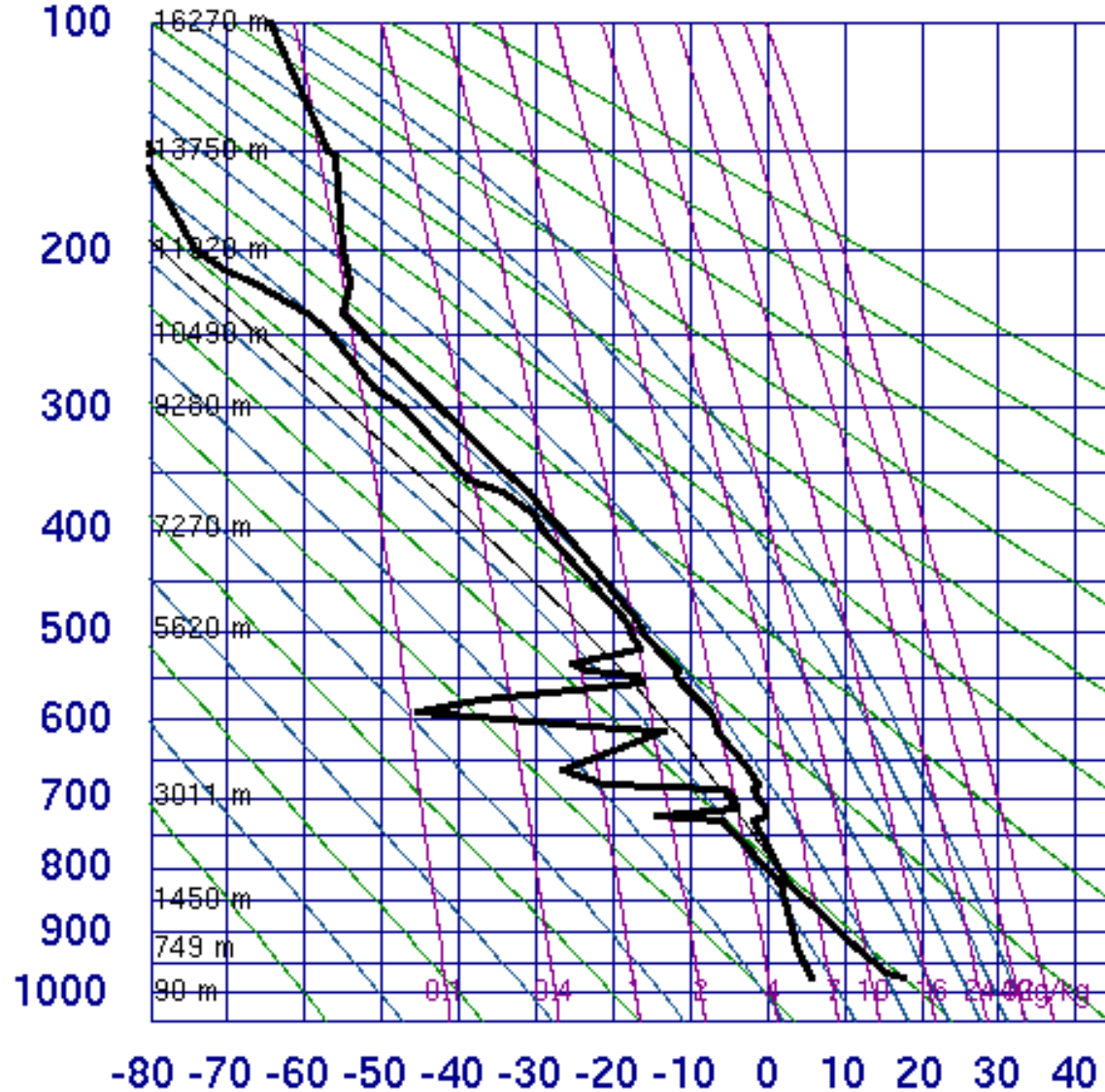


**Die ideale Welle im Mittelgebirge –
hier Altvatergebirge (CZ) am 4.10. 2009 ?**

Idealströmung von W bis SW

11520 Praha-Libus

7200 m
904 km



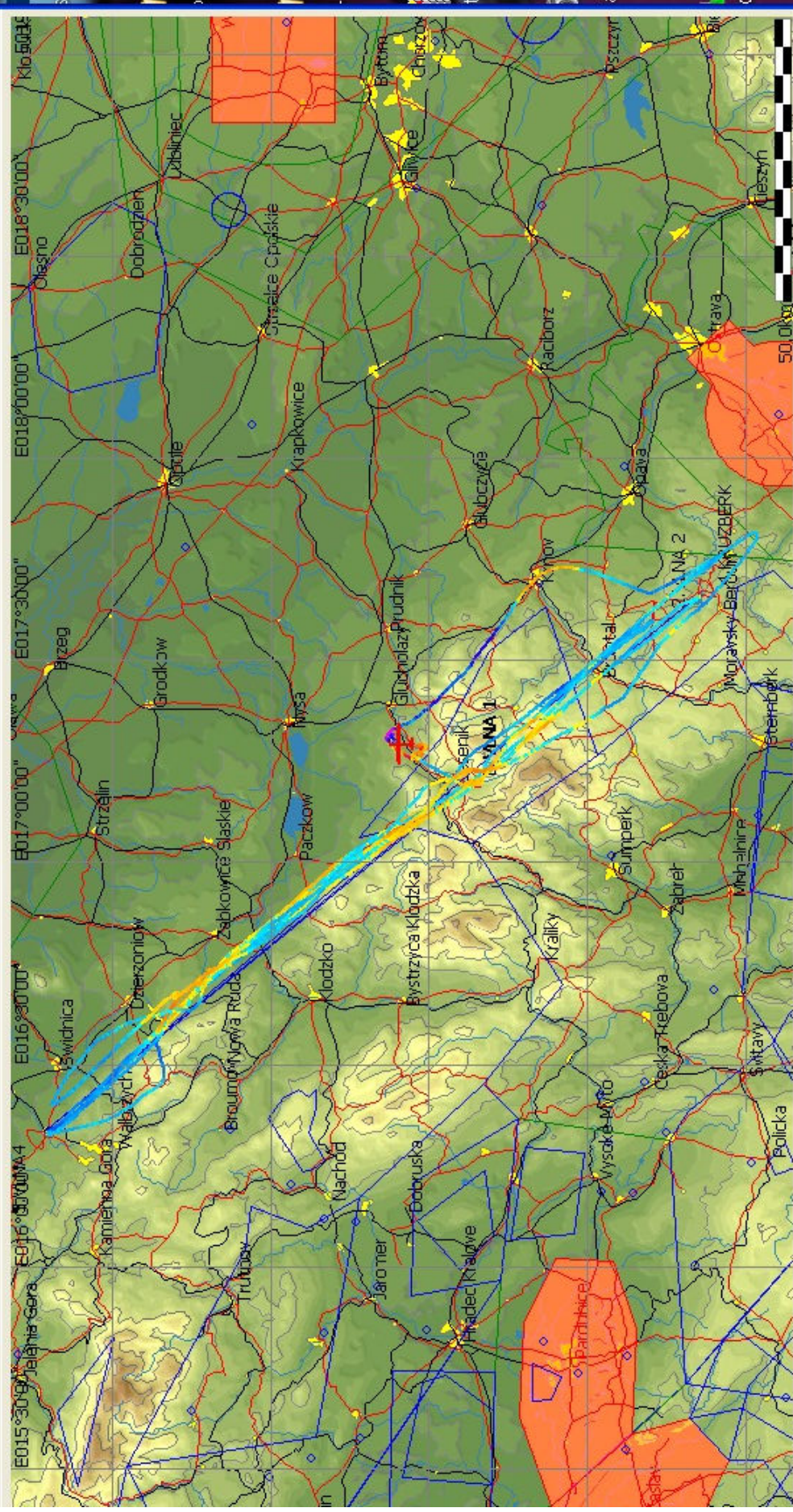
| | |
|------|-------|
| SLAT | 50.00 |
| SLON | 14.45 |
| SELV | 303.0 |
| SHOW | 8.18 |
| LIFT | 7.51 |
| LFTV | 7.63 |
| SWET | 151.9 |
| KINX | 20.40 |
| CTOT | 18.40 |
| VTOT | 21.10 |
| TOTL | 39.50 |
| CAPE | 3.26 |
| CAPV | 4.93 |
| CINS | 0.00 |
| CINV | 0.00 |
| EQLV | 819.0 |
| EQTV | 814.5 |
| LFCT | 824.0 |
| LFCV | 824.0 |
| BRCH | 0.04 |
| BRCV | 0.05 |
| LCLT | 275.8 |
| LCLP | 824.0 |
| MLTH | 291.5 |
| MLMR | 5.67 |
| THCK | 5530. |
| PWAT | 18.47 |

12Z 04 Oct 2009

University of Wyoming

9a4lku41.igc

Flug anpassen
Vertikalgeschwin
Extras Fenster Hilfe

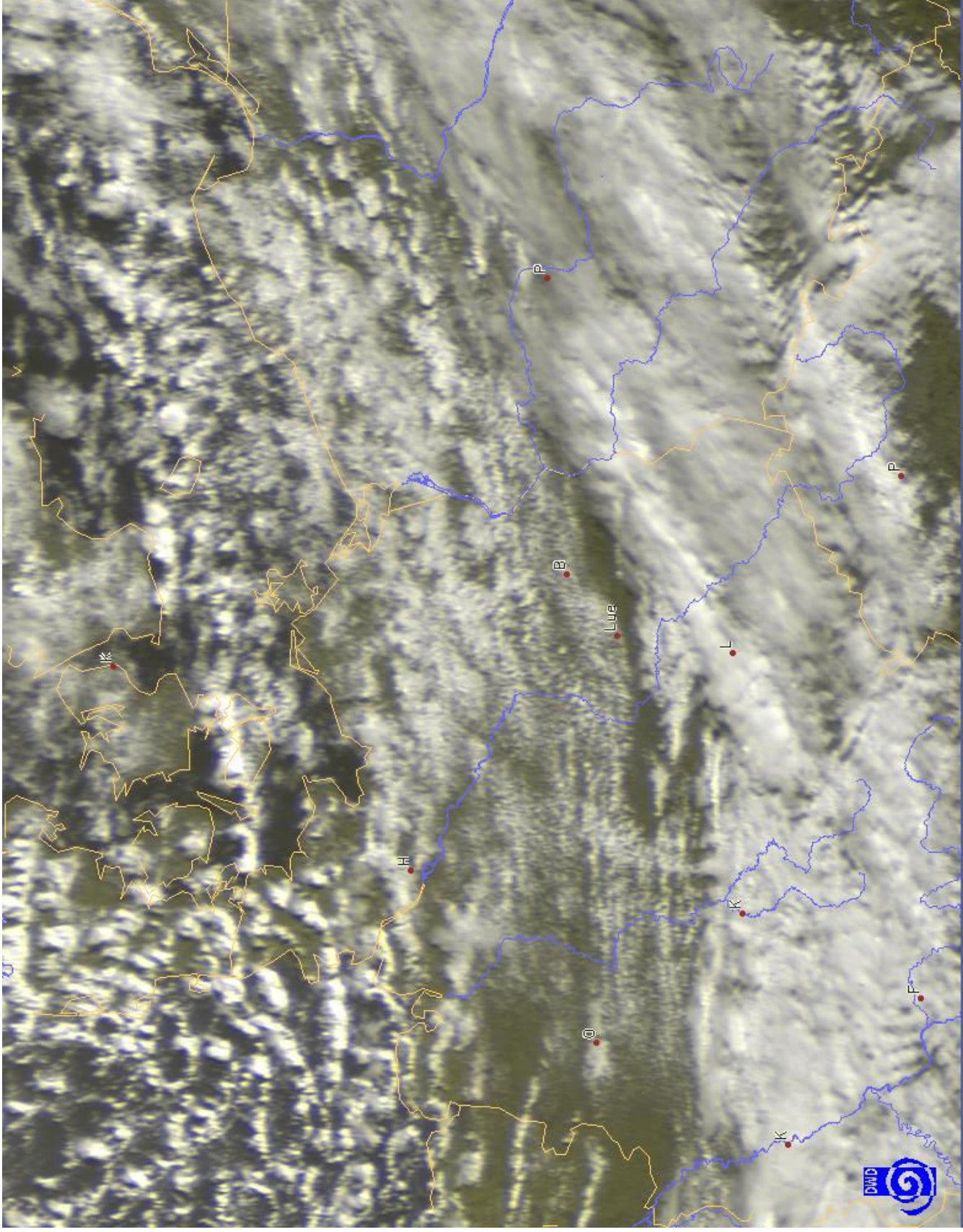


| Höhe | Vario | vGd. | dt | dH | Mittl. ... | Mittl.G... | mitUm... | Gleitzahl | Dist.Aufg. | Vt | Vm | L/D Ziel | Wind | AGL | IAS | TA |
|------|-------|--------|-------|----|------------|------------|----------|-----------|------------|------------|---------|----------|------|-----|-----|----|
| L2 | 404m | 0,0m/s | 0km/h | | | | | | -7440 | 233°/0kr0m | 0,0km/h | 0,0 | | | | |

N50°33'30" E016°00'35" 519m, D=95,3km E=-825

CSSEL IUAIS

NASA Eurasia...



Schwache Welle am Harz 29.11.09

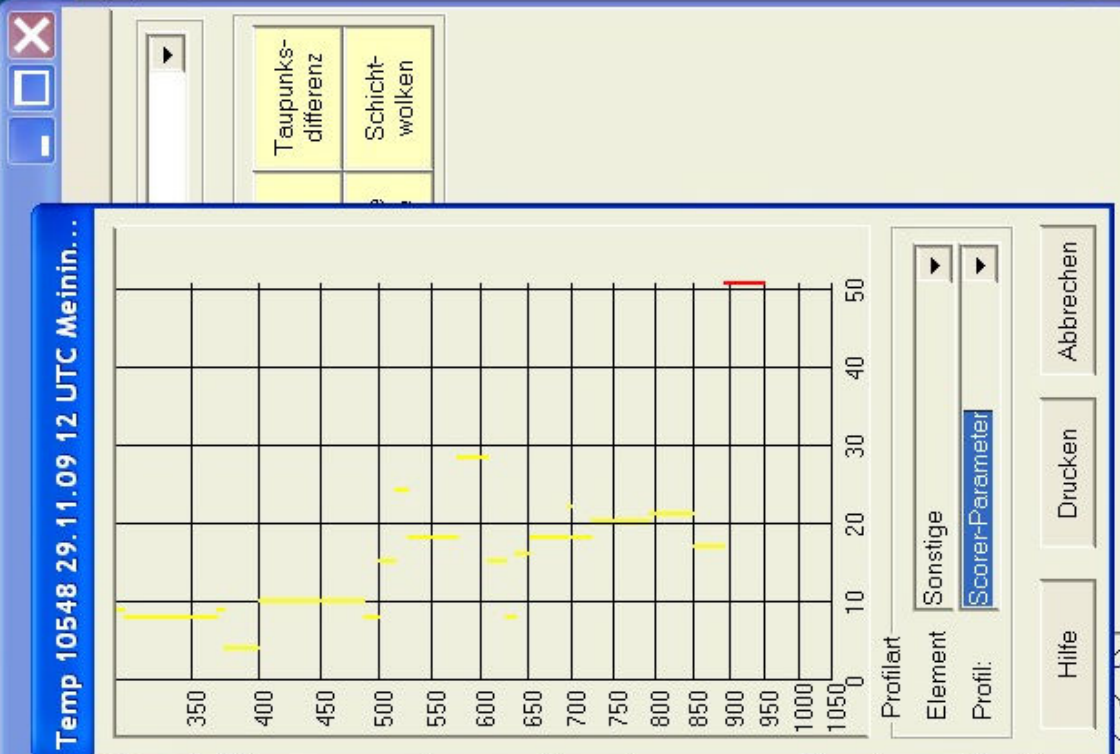
- Bis 2000 m Höhe nur schwaches Steigen
- trotz vielversprechender Wolken im höheren Niveau



TEMP - Diagramm

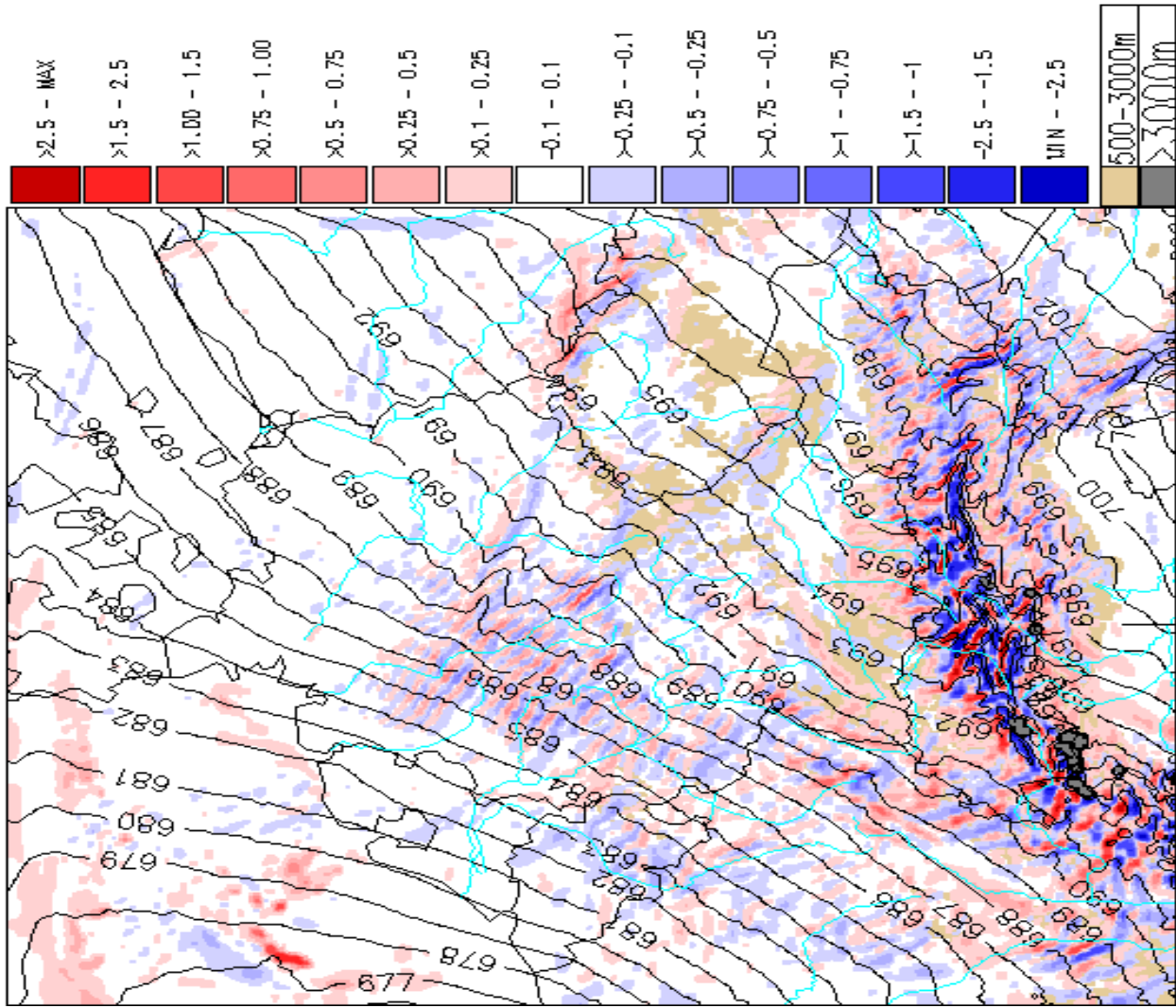


Temp 10548 29.11.09 12 UTC Meiningen

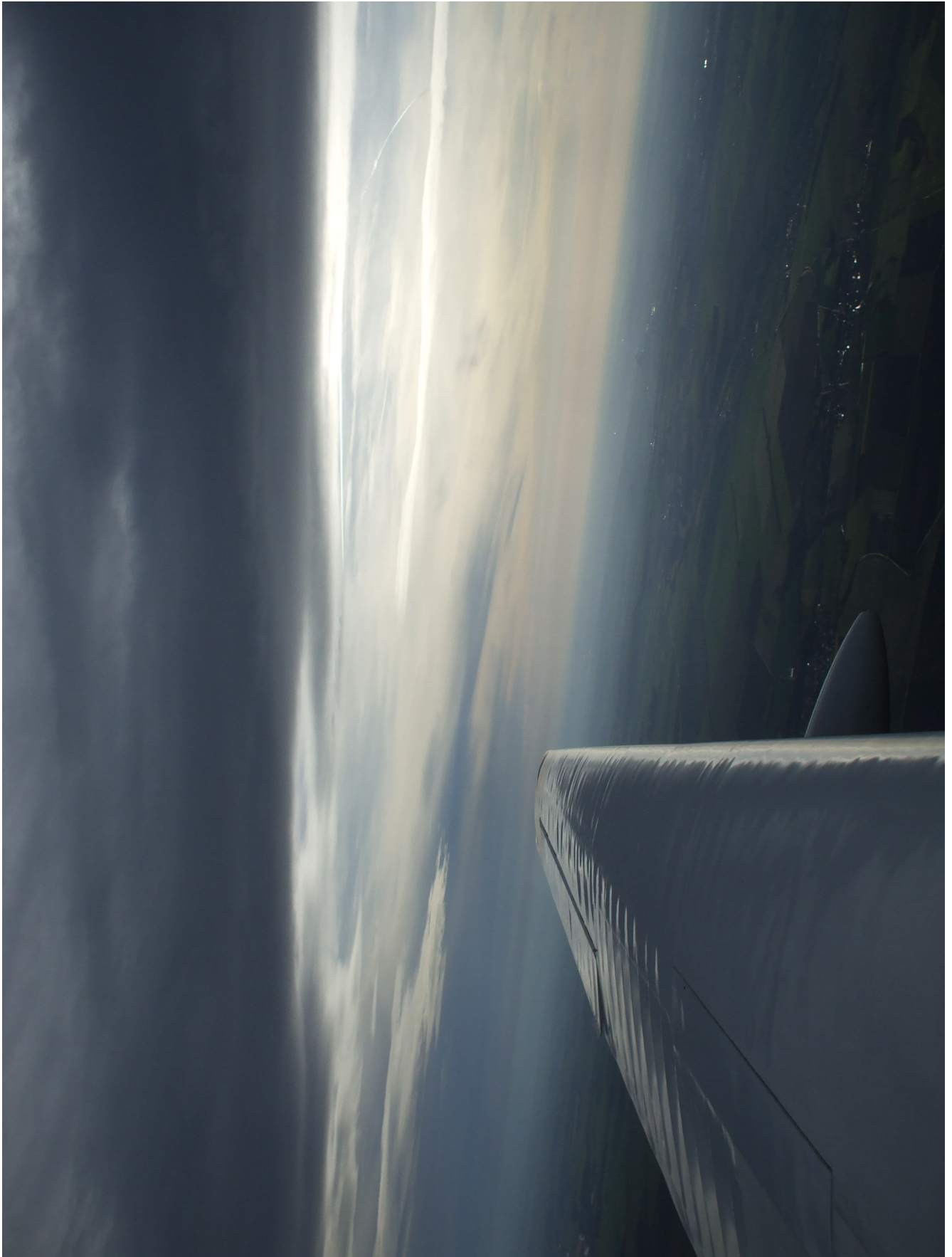


Temp 10548 29.11.09 12 UTC Meinin...

| | |
|--------------------|----------------|
| Taupunkt-differenz | Schicht-wolken |
|--------------------|----------------|



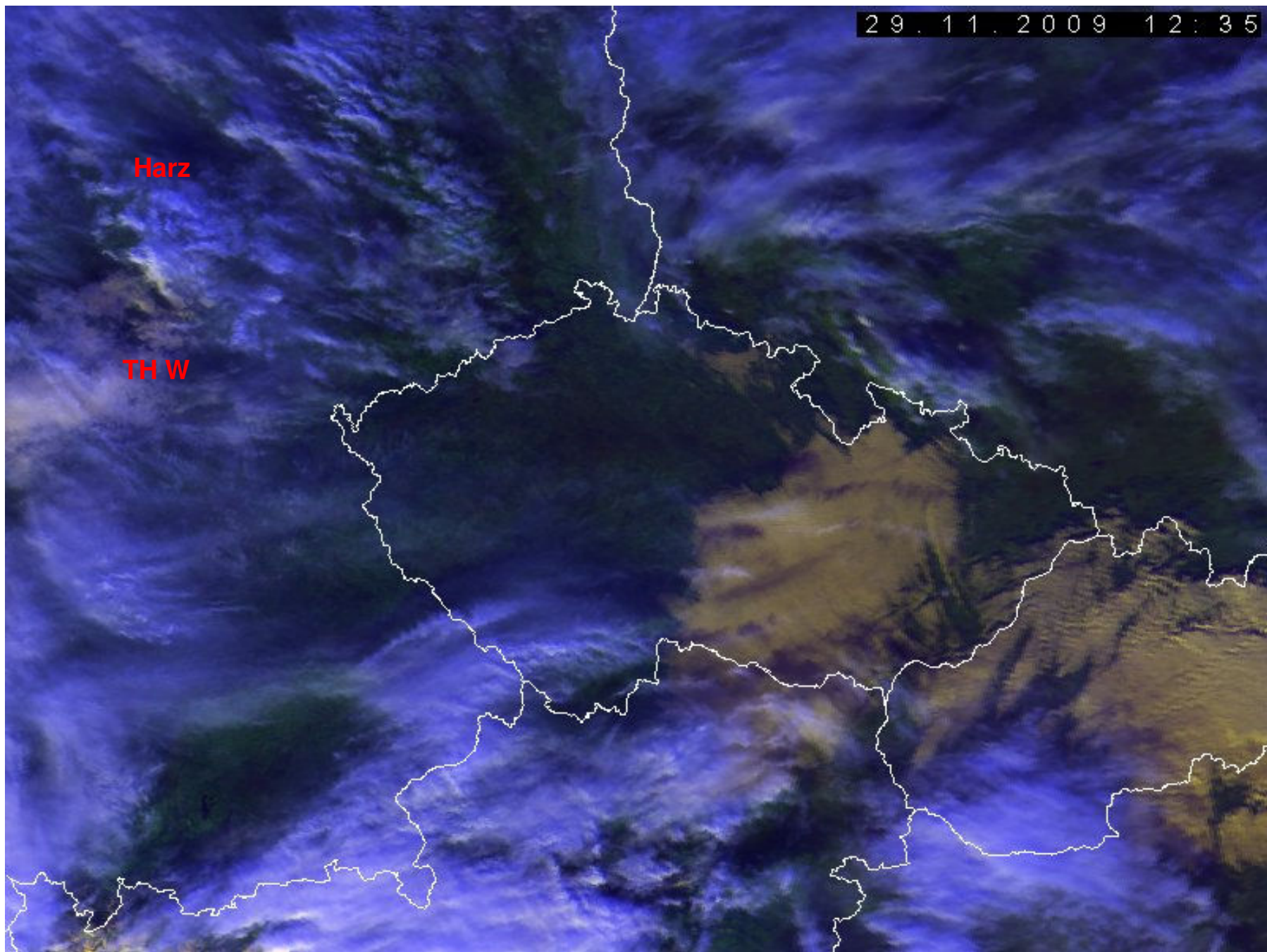
3000 m Druck LM3MO (Pa)
 3000 m Vert.Wind. LM3MO (m/s)
 VT: So 29-11-2009 12 UTC (So 15 + 21)
 © 2009 Deutscher Wetterdienst



29.11.2009 12:35

Harz

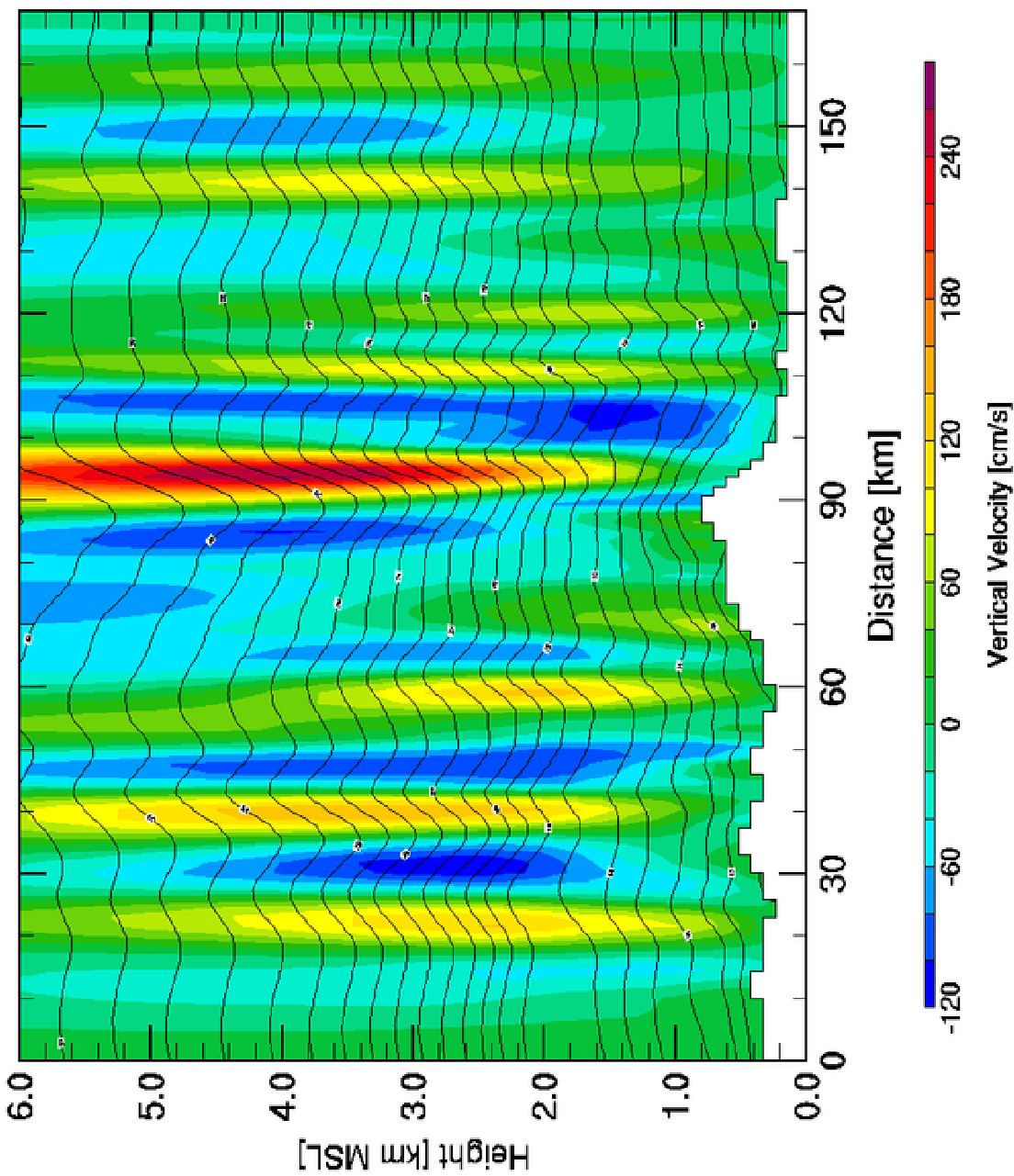
TH W





Angled Section: Vertical Velocity & Pot. Temp. (C)

Valid 1200 CET (1100Z) SUN 29 Nov 2009 [23hrFcst@1700z]
SR00 X,Y = 124,700@15°

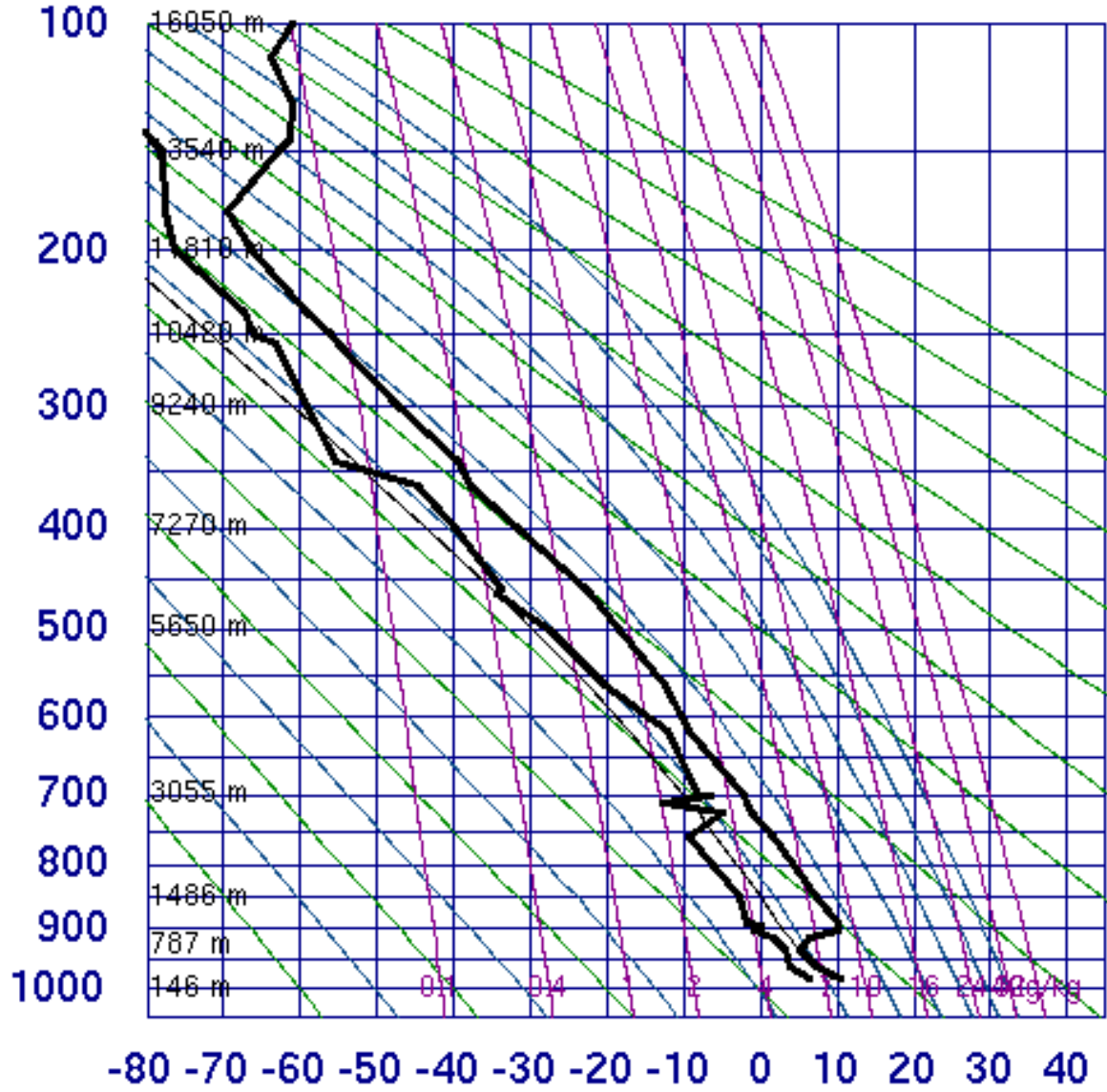


Gute Welle bei geringer Windgeschwindigkeit am 11.11.09

**Auf der Suche nach den unteren Randbedingungen – hier
Zittauer Gebirge bis Adlergebirge**

11520 Praha-Libus

7100 m
636 km



| | |
|------|-------|
| SLAT | 50.02 |
| SLON | 14.45 |
| SELV | 303.0 |
| SHOW | 7.01 |
| LIFT | 11.06 |
| LFTV | 11.08 |
| SWET | 85.47 |
| KINX | 17.30 |
| CTOT | 15.90 |
| VTOT | 25.90 |
| TOTL | 41.80 |
| CAPE | 0.00 |
| CAPV | 0.00 |
| CINS | 0.00 |
| CINV | 0.00 |
| EQLV | -9999 |
| EQTV | -9999 |
| LFCT | -9999 |
| LFCV | -9999 |
| BRCH | 0.00 |
| BRCV | 0.00 |
| LCLT | 276.4 |
| LCLP | 909.4 |
| MLTH | 284.0 |
| MLMR | 5.36 |
| THCK | 5504. |
| PWAT | 15.63 |

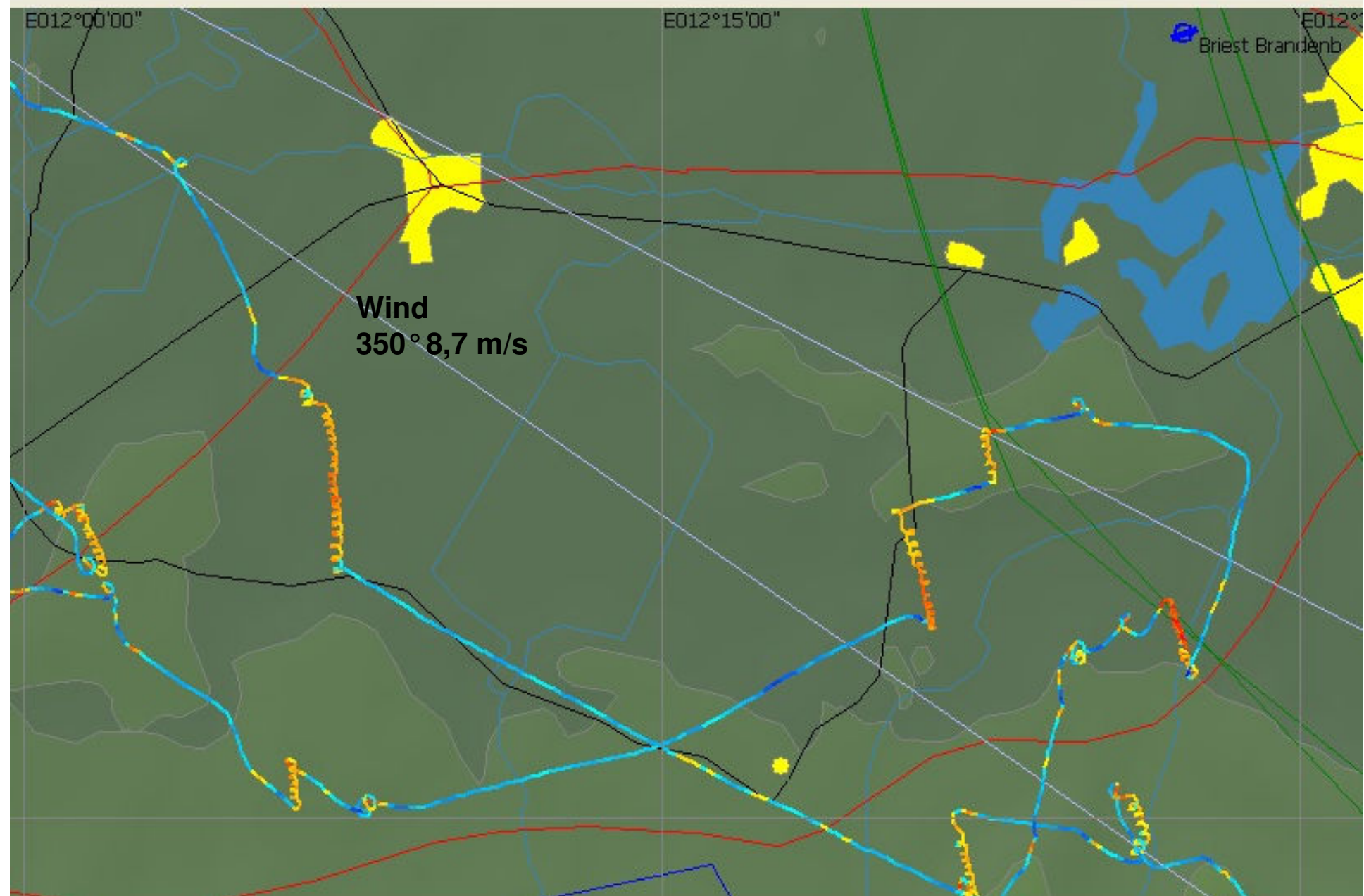
12Z 11 Nov 2008

University of Wyoming

Erwartung und Realität am 14.10.2009

50km Vertikalgeschwin u=5

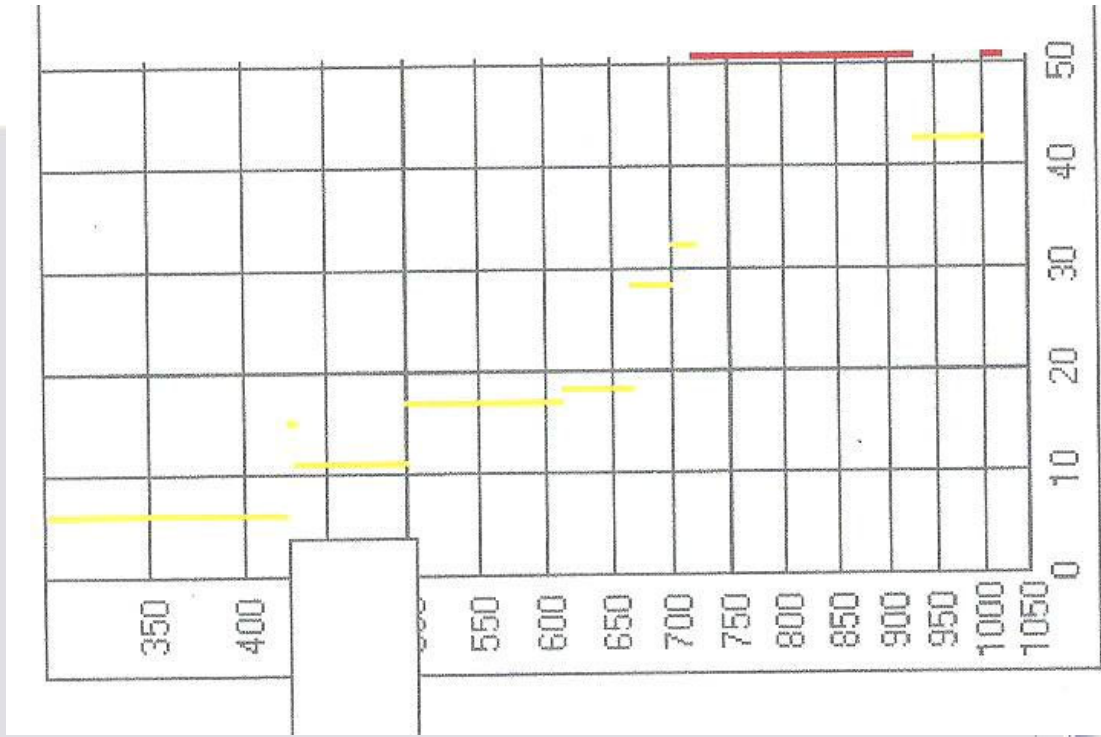
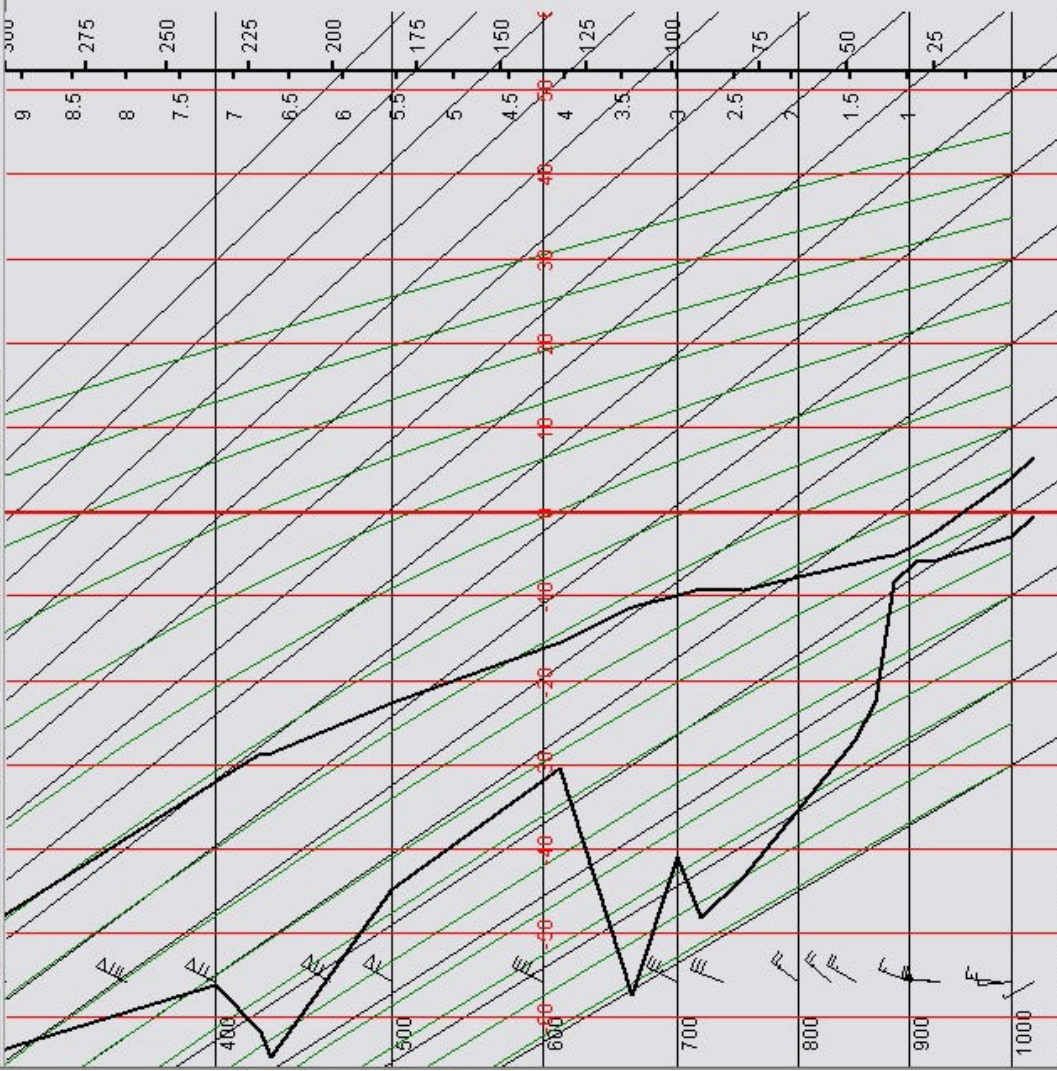
Ansicht Animation Extras Fenster Hilfe

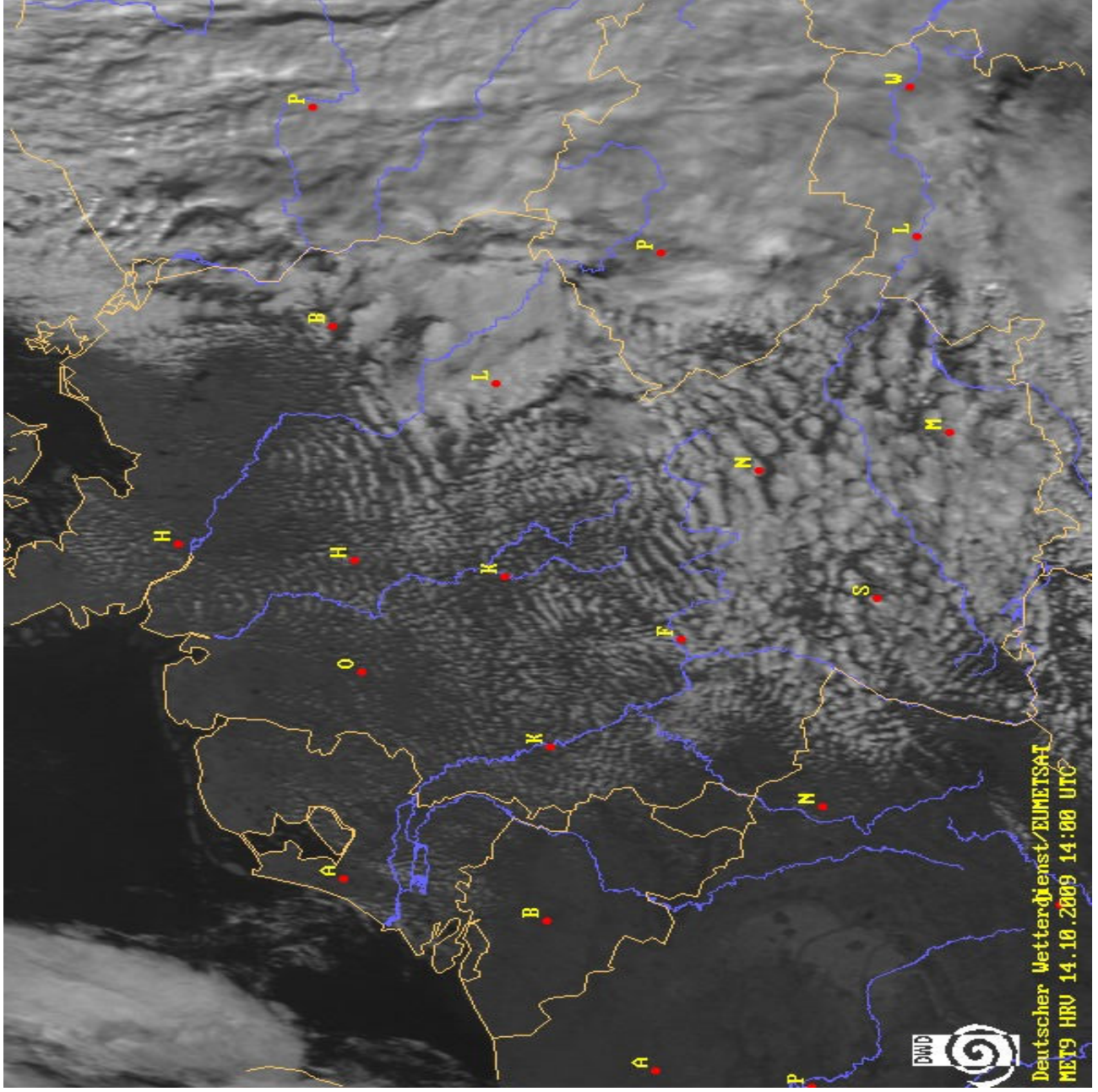


10238 ETGB Bergen Observations at 12Z 14 Oct 2009

| PRES | HGHT | TEMP | DWPT | RELH | MIXR | DRCT | SKNT | THTA | THTE |
|--------------|-------------|-------------|--------------|-----------|-------------|-----------|-----------|--------------|-------------------|
| hPa | m | C | C | % | g/kg | deg | knot | K | K |
| 1022.0 | 69 | 6.4 | -0.6 | 61 | 3.60 | 330 | 6 | 277.8 | 287.9 |
| 1000.0 | 246 | 4.0 | -3.0 | 60 | 3.08 | 355 | 12 | 277.1 | 285.9 |
| 987.0 | 351 | 2.9 | -3.5 | 63 | 3.01 | 5 | 16 | 277.1 | 285.6 |
| 928.0 | 847 | -2.0 | -5.7 | 76 | 2.71 | 5 | 16 | 277.0 | 284.7 Krüm |
| 925.0 | 873 | -2.3 | -5.8 | 77 | 2.69 | 5 | 16 | 276.9 | 284.6 |
| 907.0 | 1029 | -3.7 | -5.7 | 86 | 2.77 | 11 | 19 | 277.1 | 284.9 Dreh |
| 886.0 | 1214 | -5.1 | -8.3 | 78 | 2.32 | 18 | 22 | 277.5 | 284.1 |
| 869.0 | 1366 | -5.5 | -22.5 | 25 | 0.73 | 23 | 26 | 278.6 | 280.9 Zuna |
| 850.0 | 1539 | -6.1 | -27.1 | 17 | 0.49 | 30 | 29 | 279.7 | 281.3 |
| 827.0 | 1752 | -6.8 | -30.8 | 13 | 0.36 | 40 | 25 | 281.2 | 282.4 |
| 753.0 | 2480 | -9.3 | -43.3 | 4 | 0.11 | 24 | 30 | 286.1 | 286.5 |
| 736.0 | 2657 | -9.2 | -45.7 | 3 | 0.09 | 20 | 31 | 288.1 | 288.4 |
| 719.0 | 2837 | -9.1 | -48.1 | 3 | 0.07 | 22 | 35 | 290.1 | 290.4 |
| 700.0 | 3044 | -9.9 | -40.9 | 6 | 0.15 | 25 | 39 | 291.5 | 292.0 |
| 665.0 | 3439 | -11.3 | -57.3 | 1 | 0.02 | 26 | 42 | 294.2 | 294.3 |
| 612.0 | 4073 | -15.5 | -30.5 | 26 | 0.50 | 27 | 47 | 296.4 | 298.1 |
| 500.0 | 5580 | -22.7 | -44.7 | 12 | 0.14 | 30 | 60 | 305.3 | 305.9 |
| 463.0 | 6134 | -25.8 | -54.9 | 5 | 0.05 | 30 | 72 | 308.3 | 308.5 |
| 430.0 | 6668 | -28.7 | -64.7 | 2 | 0.01 | 27 | 73 | 311.1 | 311.2 |
| 424.0 | 6768 | -28.7 | -61.7 | 3 | 0.02 | 27 | 73 | 312.4 | 312.5 |
| 400.0 | 7180 | -32.1 | -56.1 | 7 | 0.05 | 25 | 74 | 313.2 | 313.4 |
| 355.0 | 7997 | -38.6 | -59.2 | 9 | 0.04 | 25 | 80 | 315.4 | 315.5 |
| 300.0 | 9150 | -47.7 | -63.7 | 14 | 0.02 | 25 | 76 | 318.0 | 318.1 |
| 297.0 | 9216 | -48.3 | -63.3 | 16 | 0.03 | 25 | 76 | 318.1 | 318.2 |
| 271.0 | 9814 | -50.5 | -68.5 | 10 | 0.01 | 25 | 78 | 323.3 | 323.4 |
| 266.0 | 9935 | -49.8 | -70.7 | 7 | 0.01 | 20 | 78 | 326.1 | 326.1 |

Krüm = Krümmung
Dreh = Drehung
Zuna = Zunahme





Wind von rechts

