

# 3 ème partie :

## R. A. S. P.

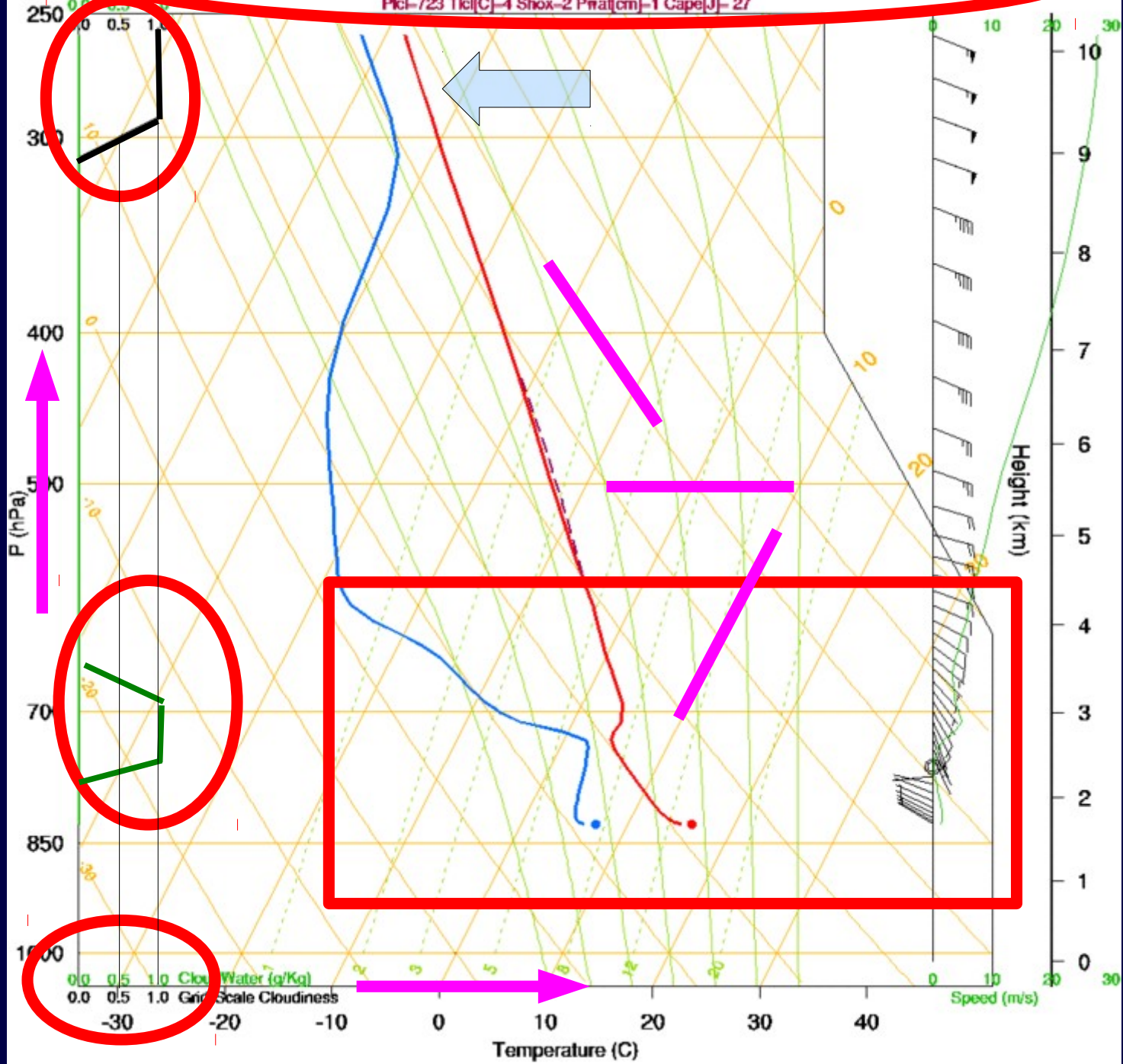
Regional Atmospheric Soaring Prediction

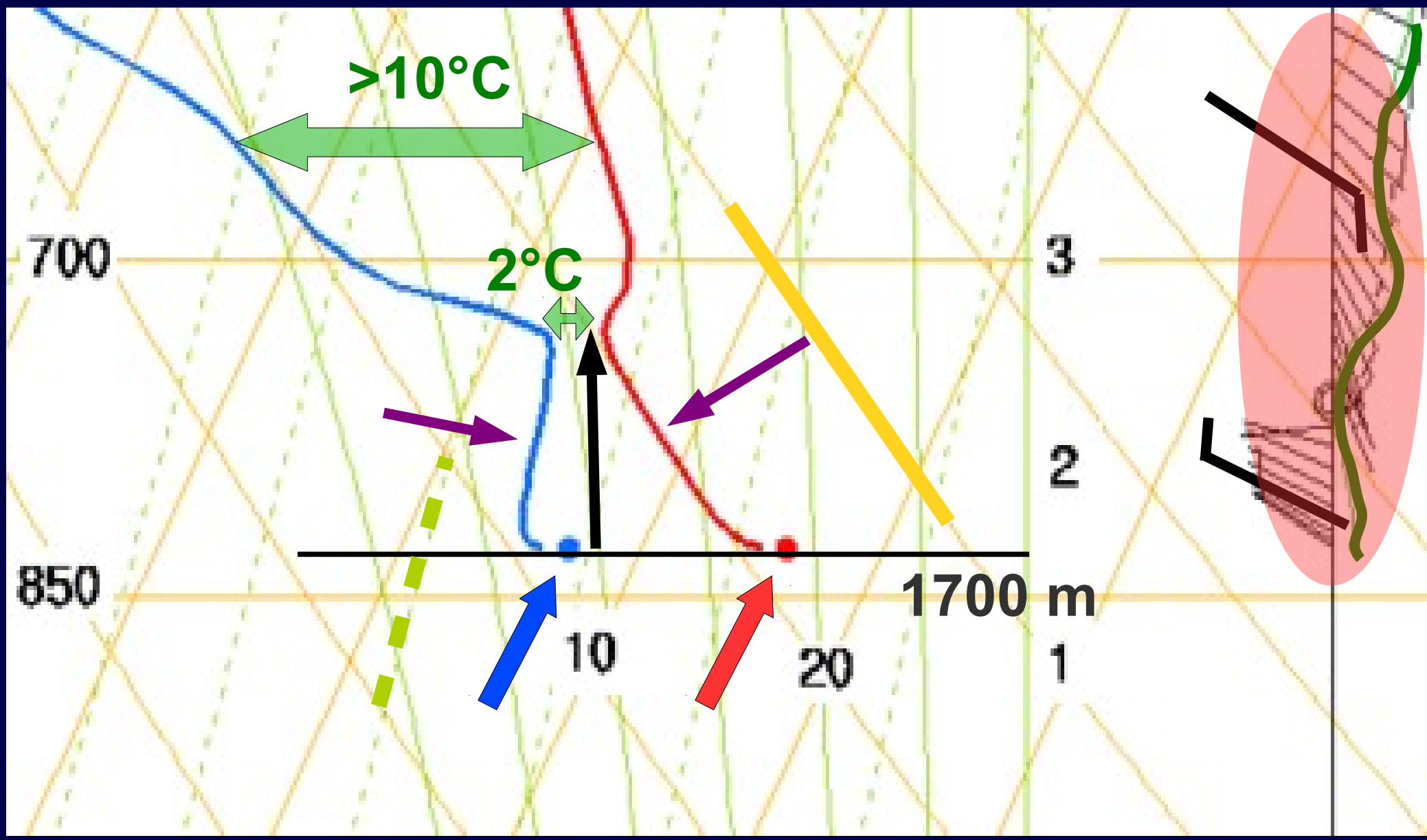
Prévision atmosphérique  
régionale = à mésoéchelle  
pour soaring = planer en utilisant les  
ascendances

CC = notion centrale de RASP.

#5 Gumfluh 46.42°, 7.2° (31,37) Valid 1200 UTC (1200Z) THU 29 Sep 2011 [24hrFcst@1809z]

PtcI-723 Tkl[C]-4 Shox-2 Pmt[cm]-1 Cape[J]-27





$>10^{\circ}\text{C}$

700

$2^{\circ}\text{C}$

3

850

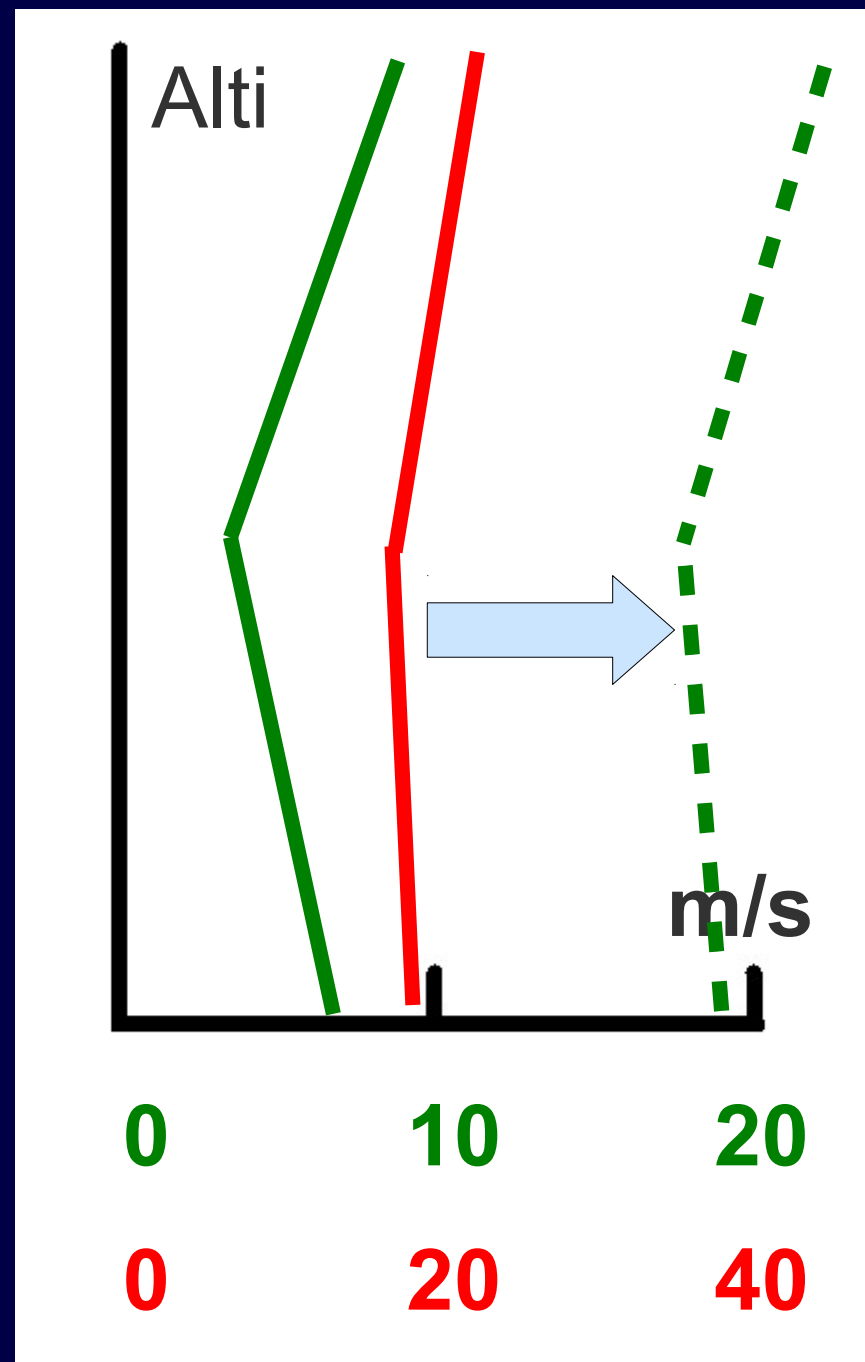
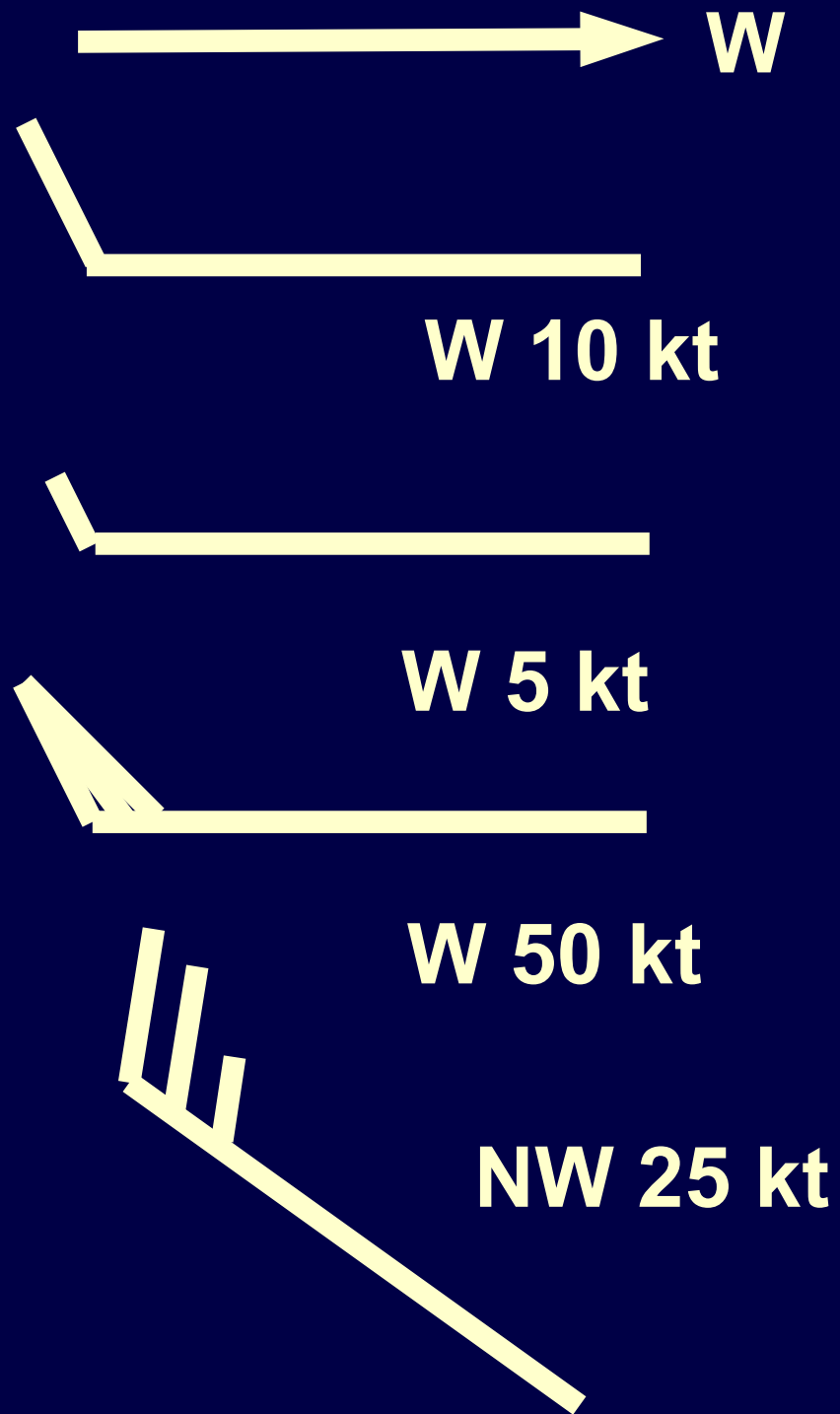
2

1700 m

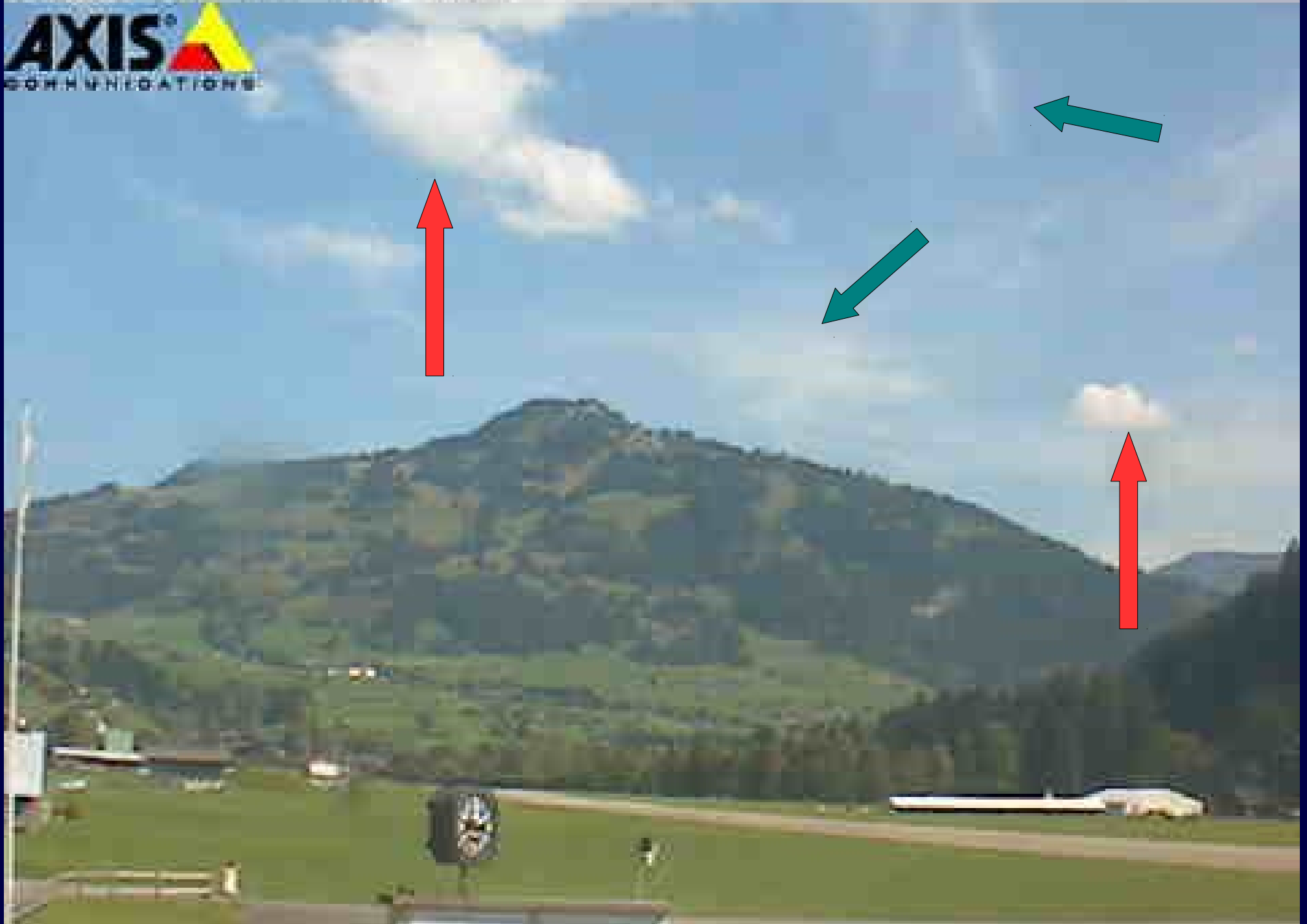
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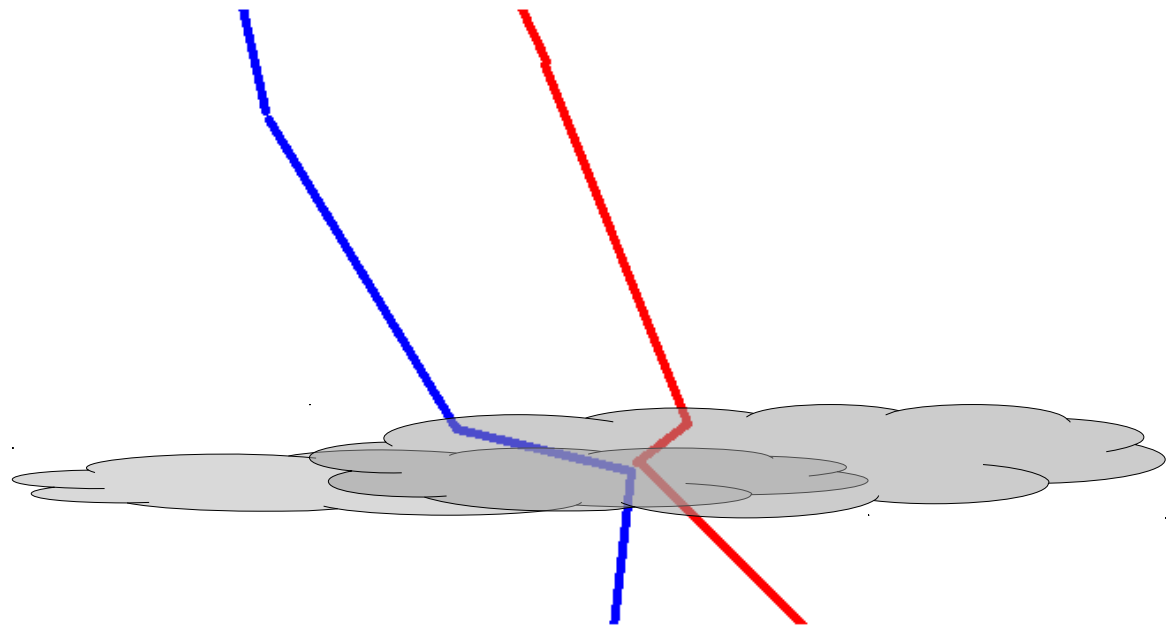
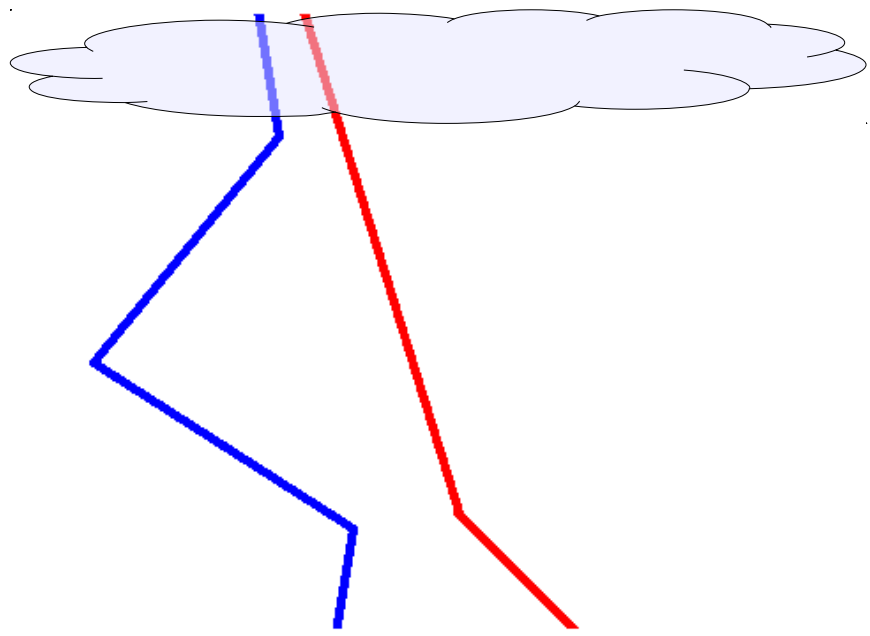
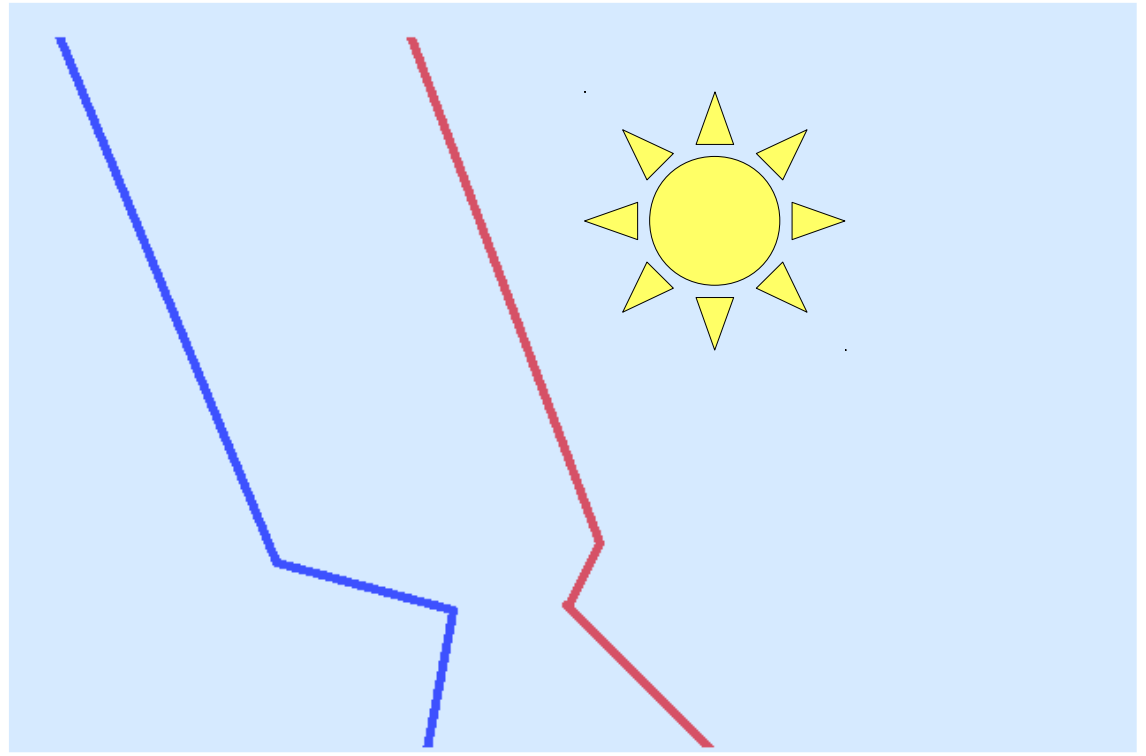
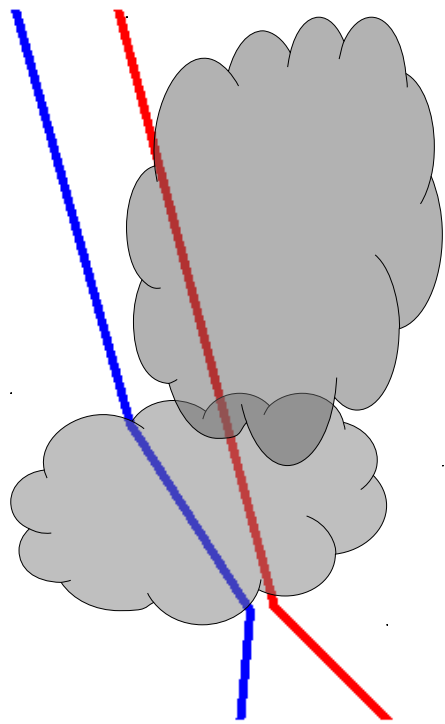
20

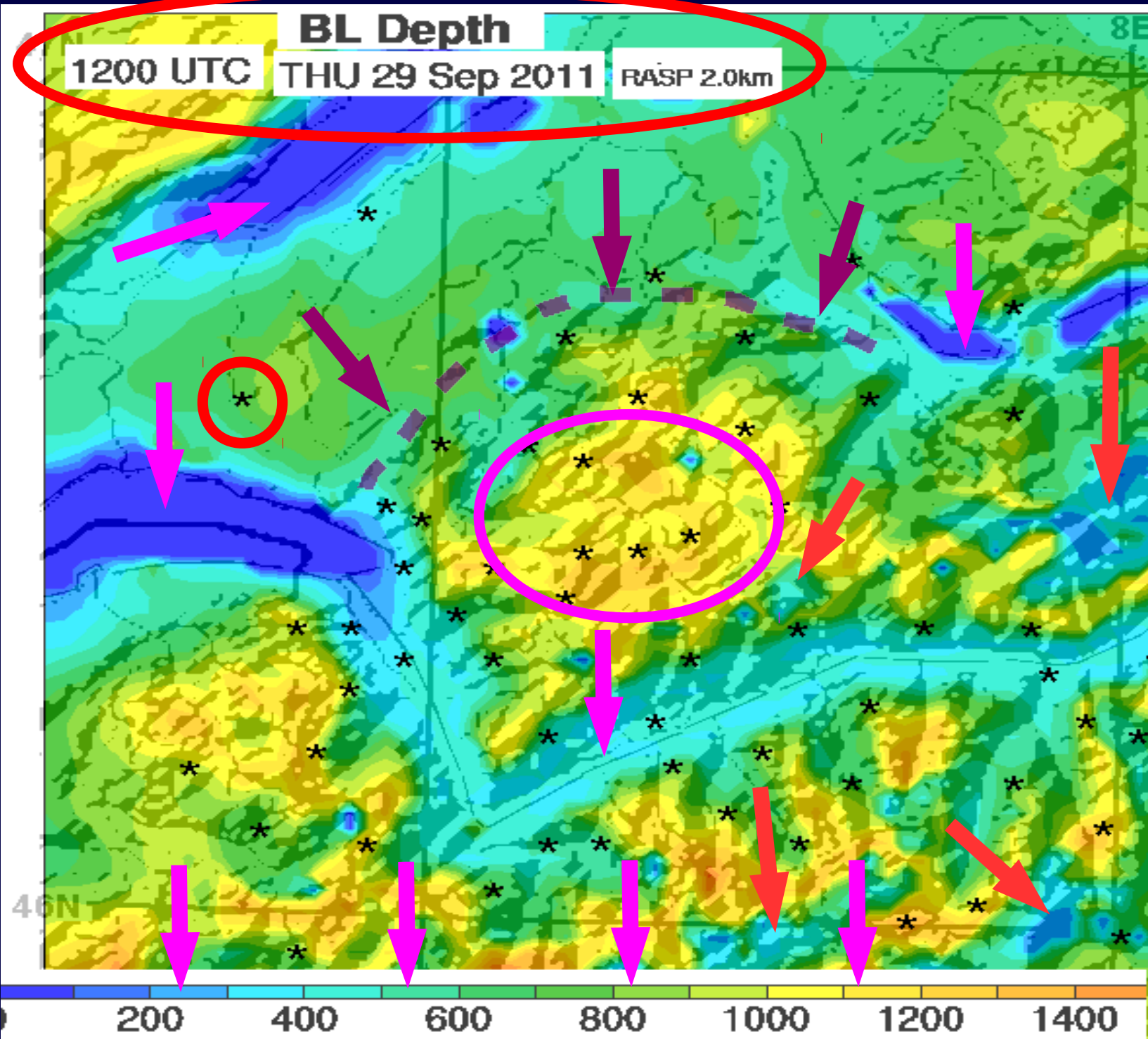
1



2011-09-29 13:59:41



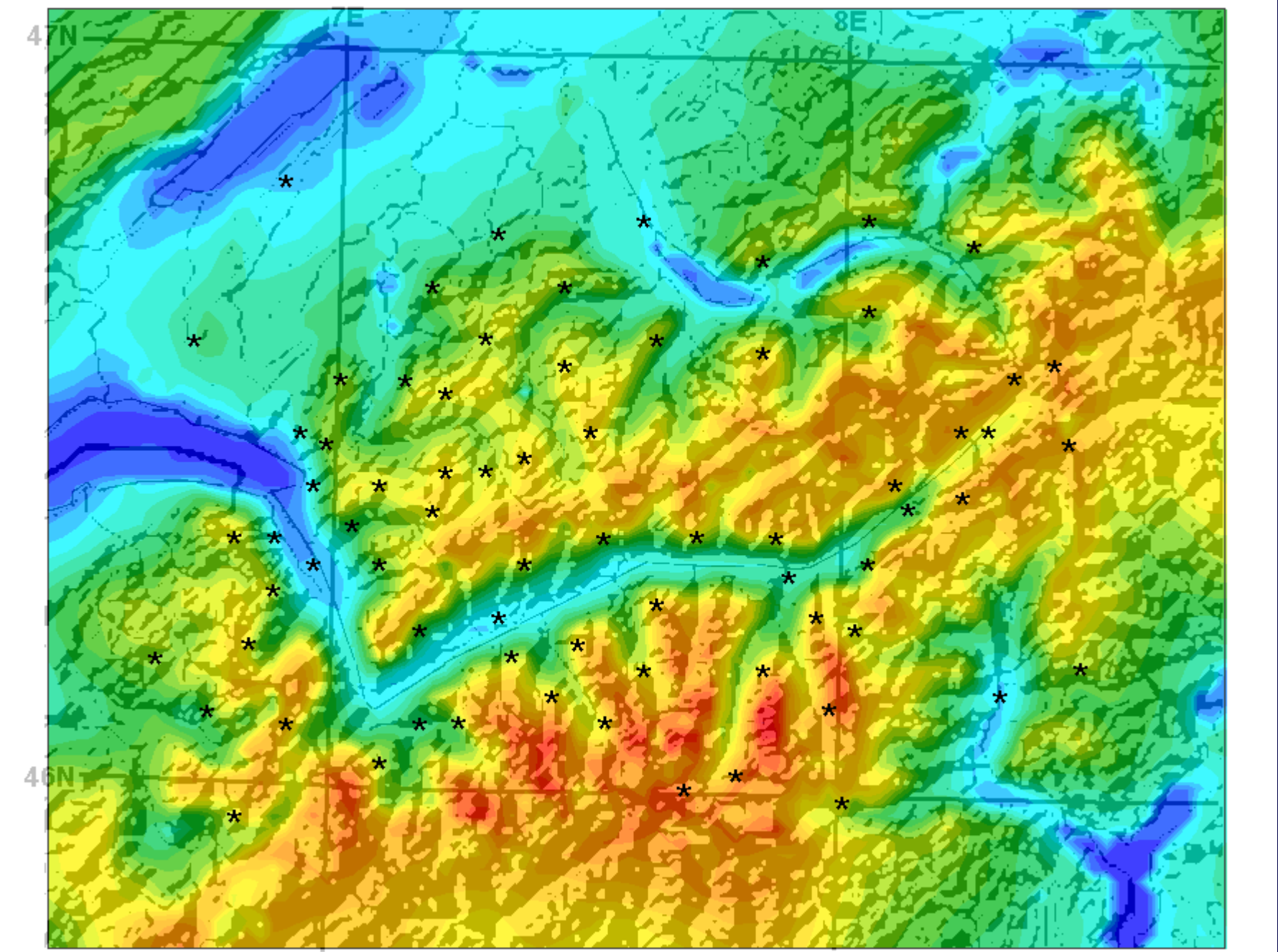






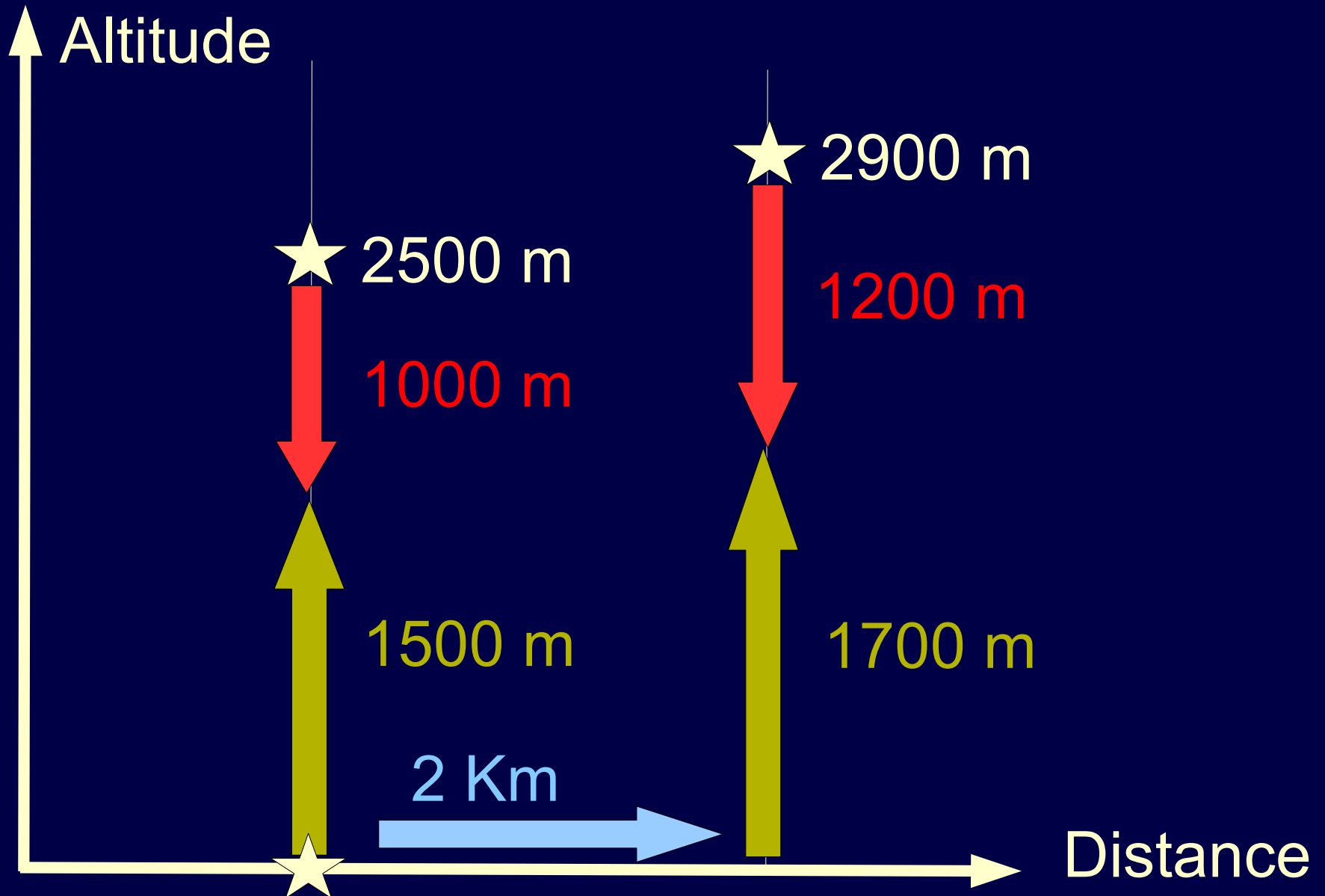
# Height of BL Top

Valid 1200 UTC (1200Z) THU 29 Sep 2011 [24hrFcst@1809z]  
Dr.Jack BLIPMAP from RASP 2.0km GFSN-initiated WRF-ARW model





Déduire l'altitude de la surface du sol à mésoéchelle par les 2 cartes précédentes :



# Exercice no 3 : Lieu de l'exercice :



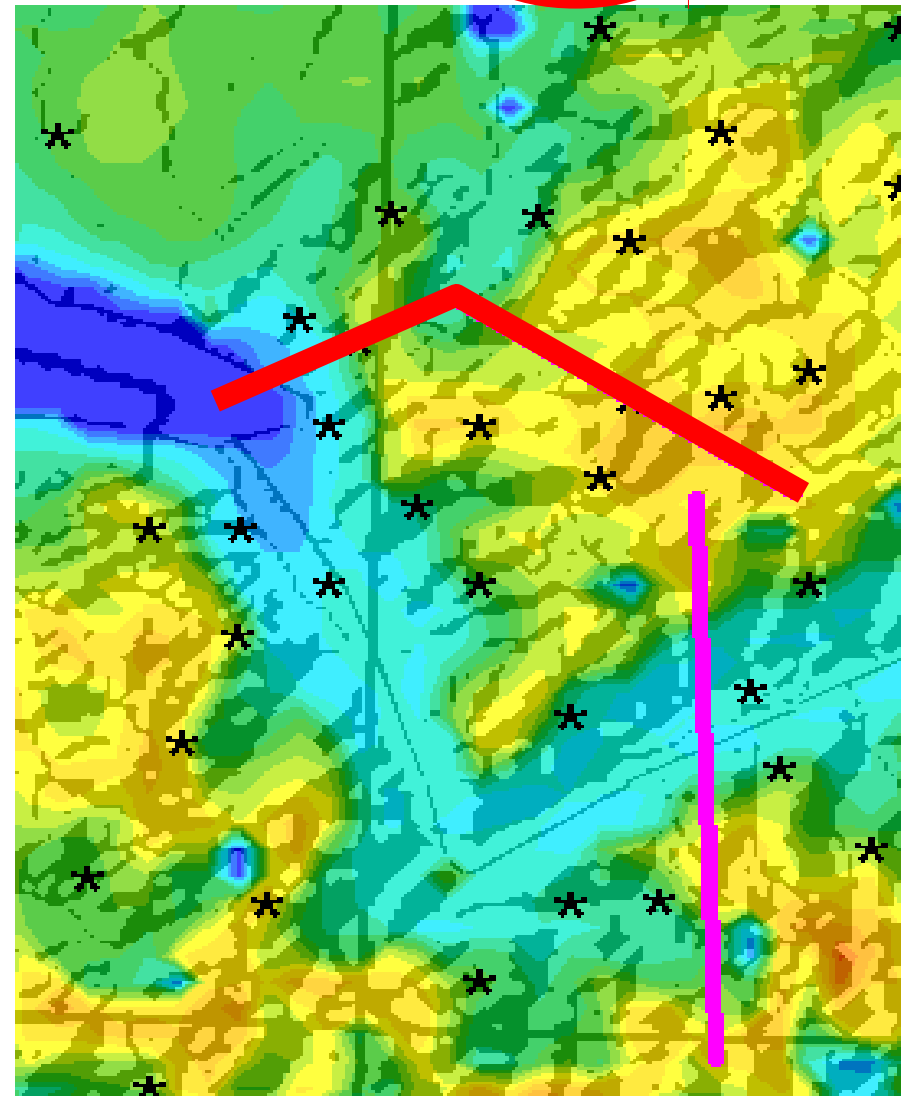
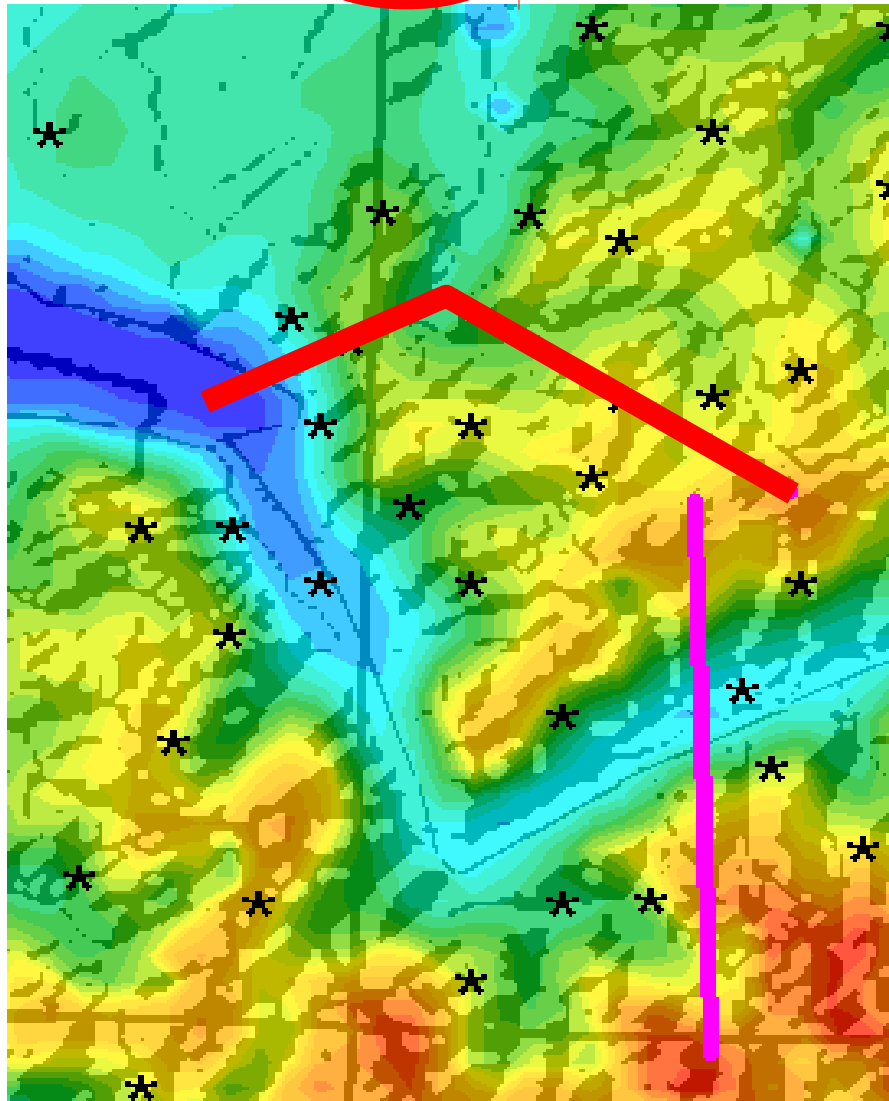
# Profil « réel » estimé :



**BLH**

29 sep 2011

**BLD**



2000

2600

3200

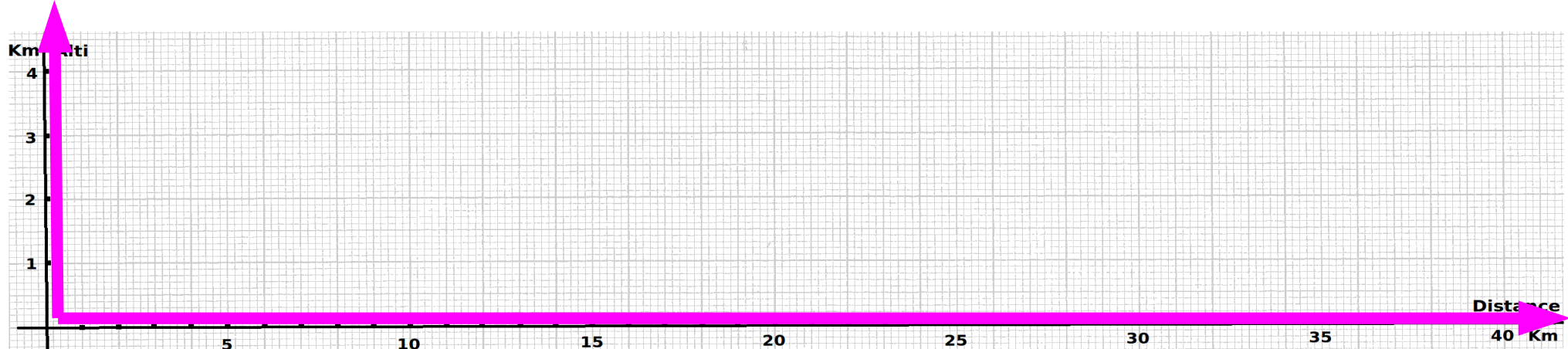
800

1000

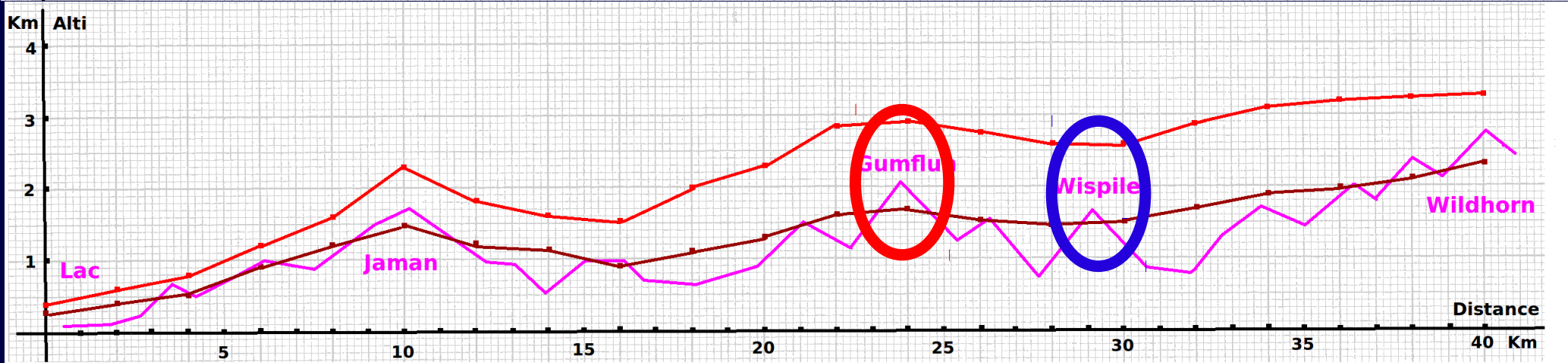
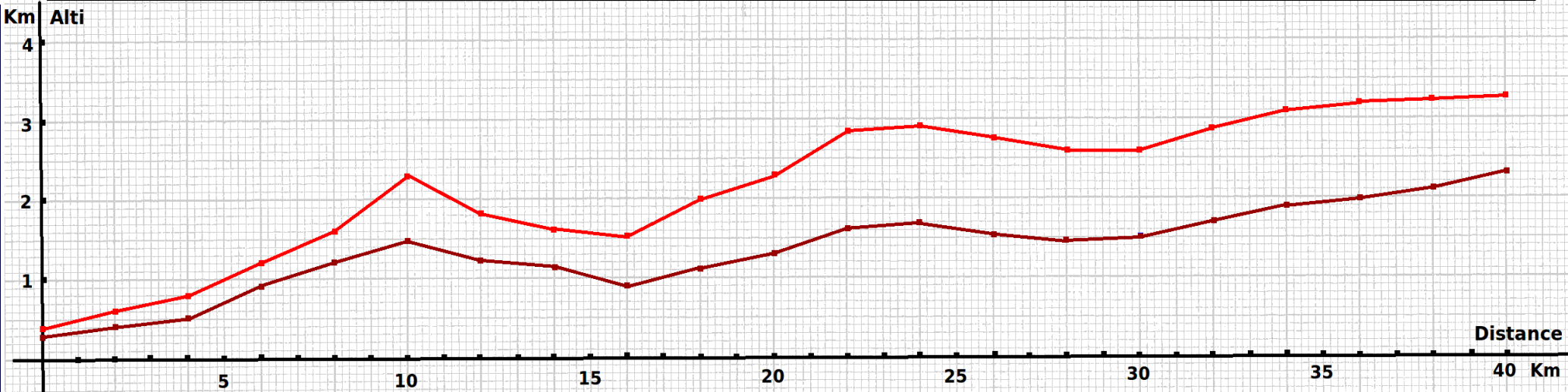
1200

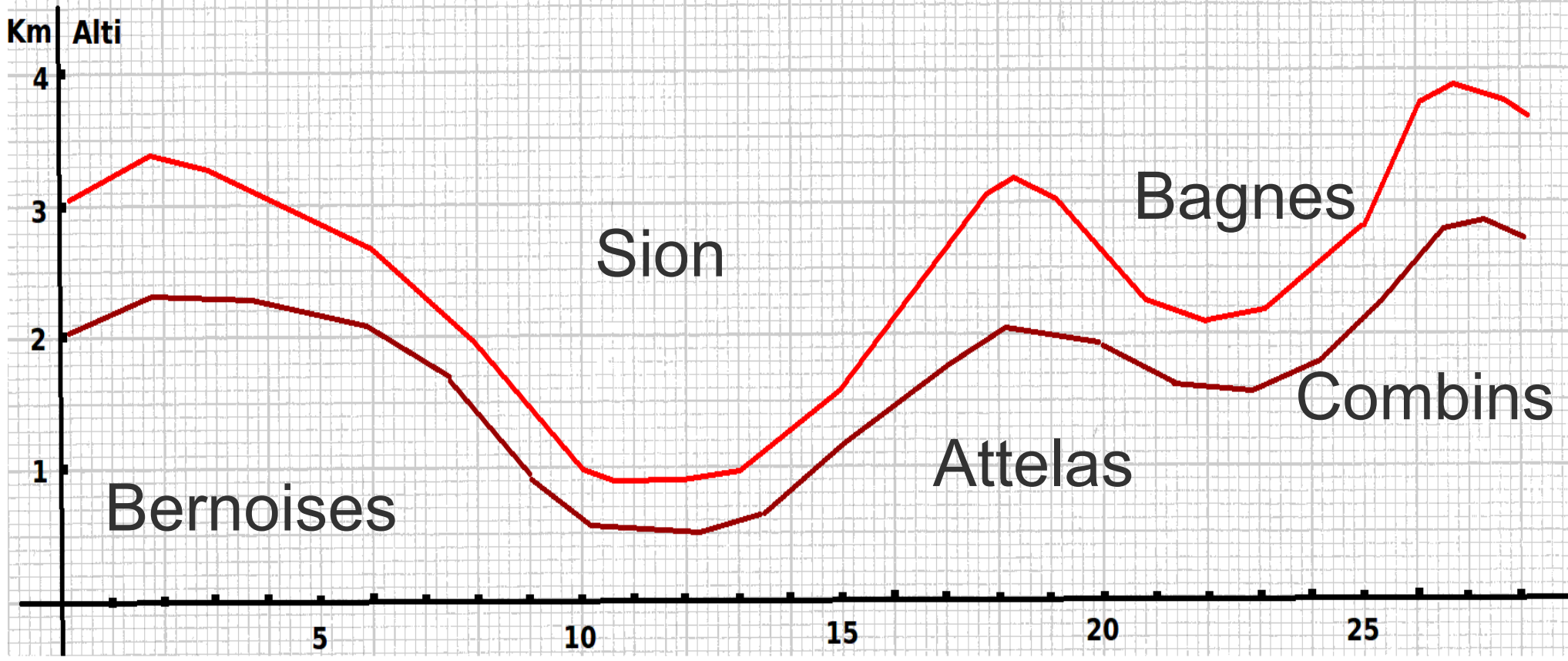
1400





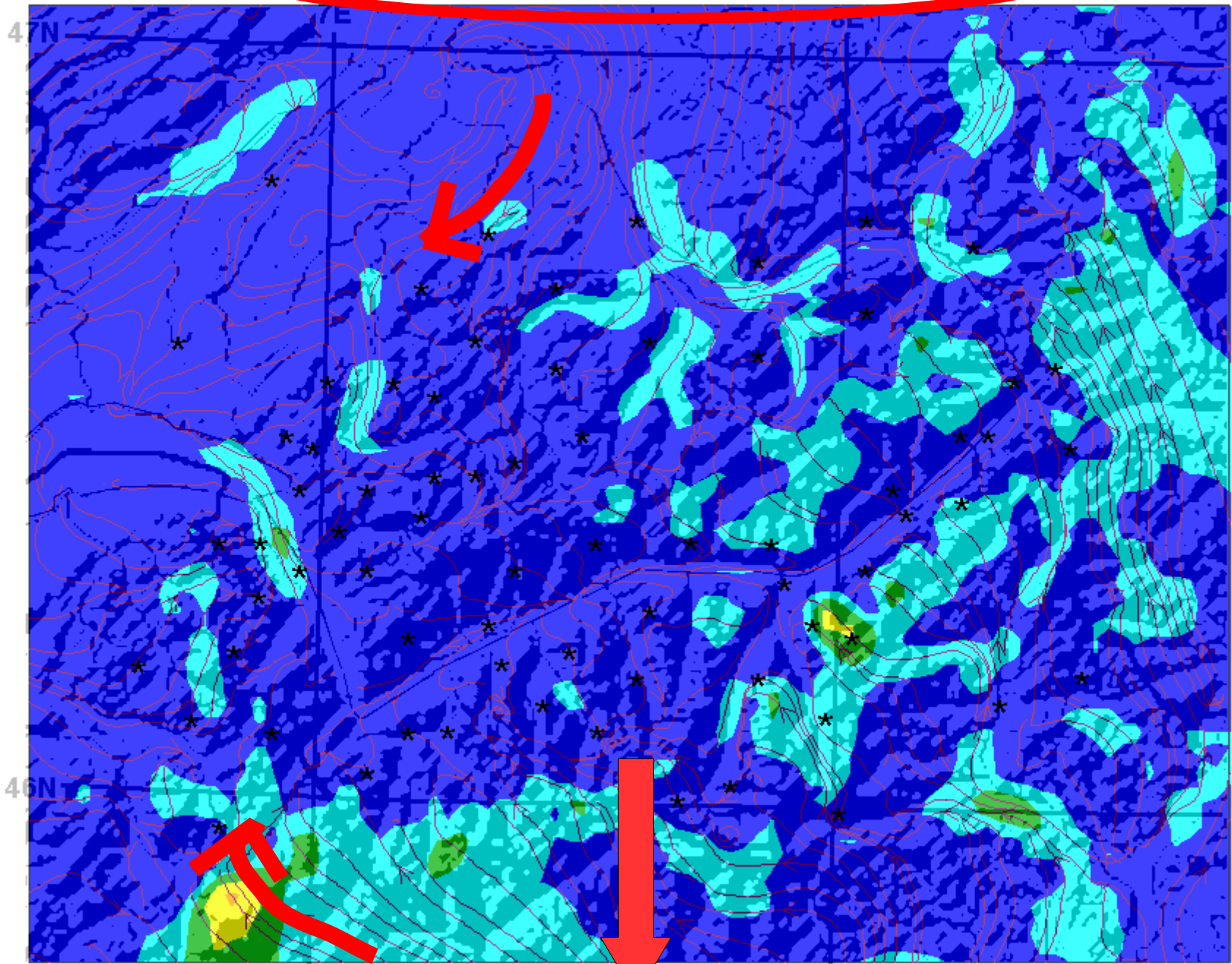
0 Km	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
400 m	600	800	1200	1600	2300	1800	1600	1500	2000	2300	2800	2900	2700	2600	2600	2900	3100	3200	3200	3300
100 m	200	300	300	400	800	600	500	600	900	1000	1200	1200	1200	1100	1000	1200	1200	1200	1100	1000





0 Km	2	4	6	8	10	12	14	16	18	20	22	24	26	28
400 m	600	800	1200	1600	2300	1800	1600	1500	2000	2300	2800	2900	2700	2600
100 m	200	300	300	400	800	600	500	600	900	1000	1200	1200	1200	1100

**BL Wind**  
Valid 1200 UTC (1200Z) THU 29 Sep 2011 [24hrFcst@1809z]  
DrJack BLIPMAP from RASP 2.0km GFSN-initiated WRF-ARW model

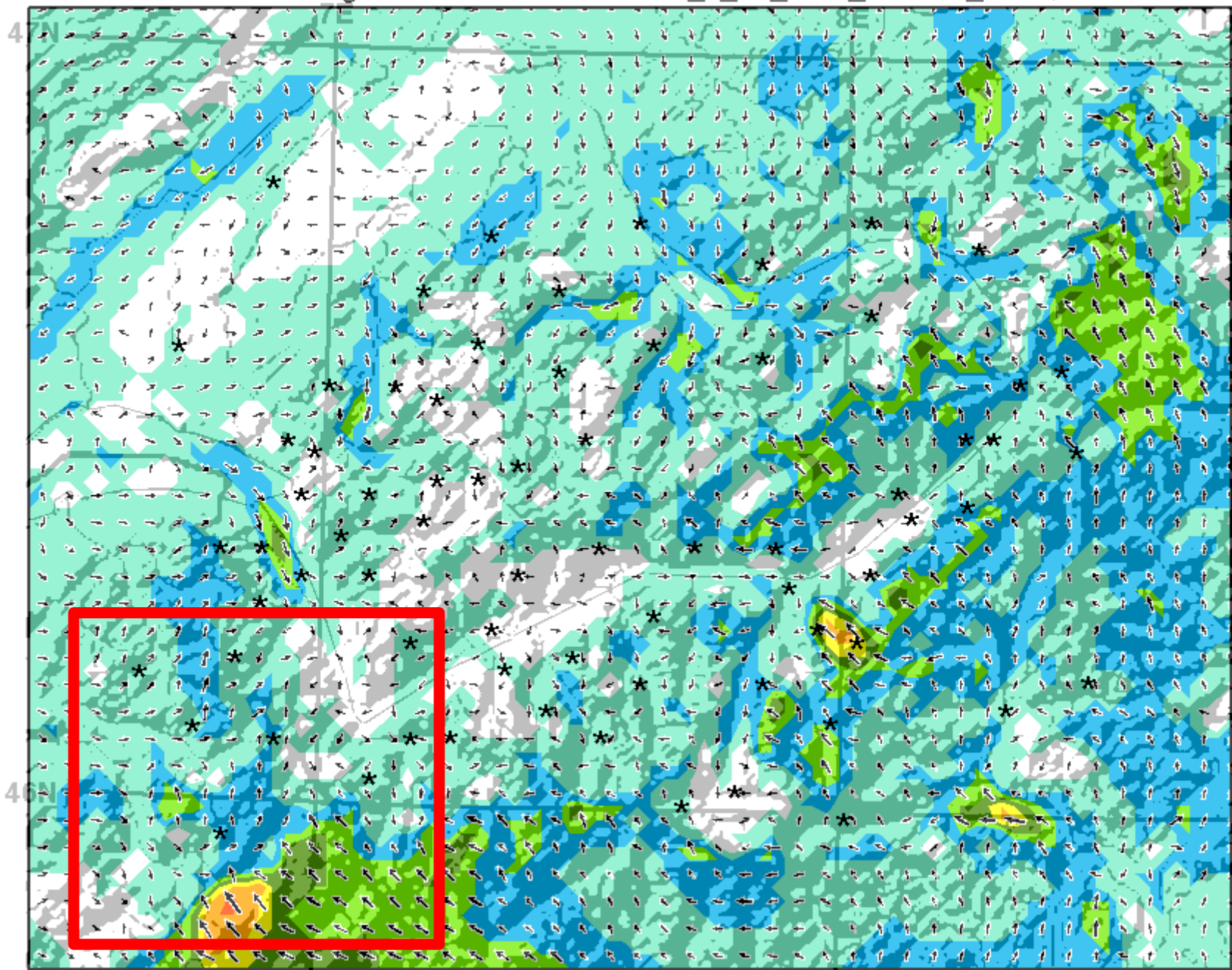


[m/s] 2 4 6 8 10 [m/s]

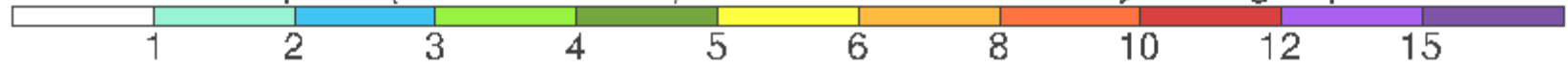


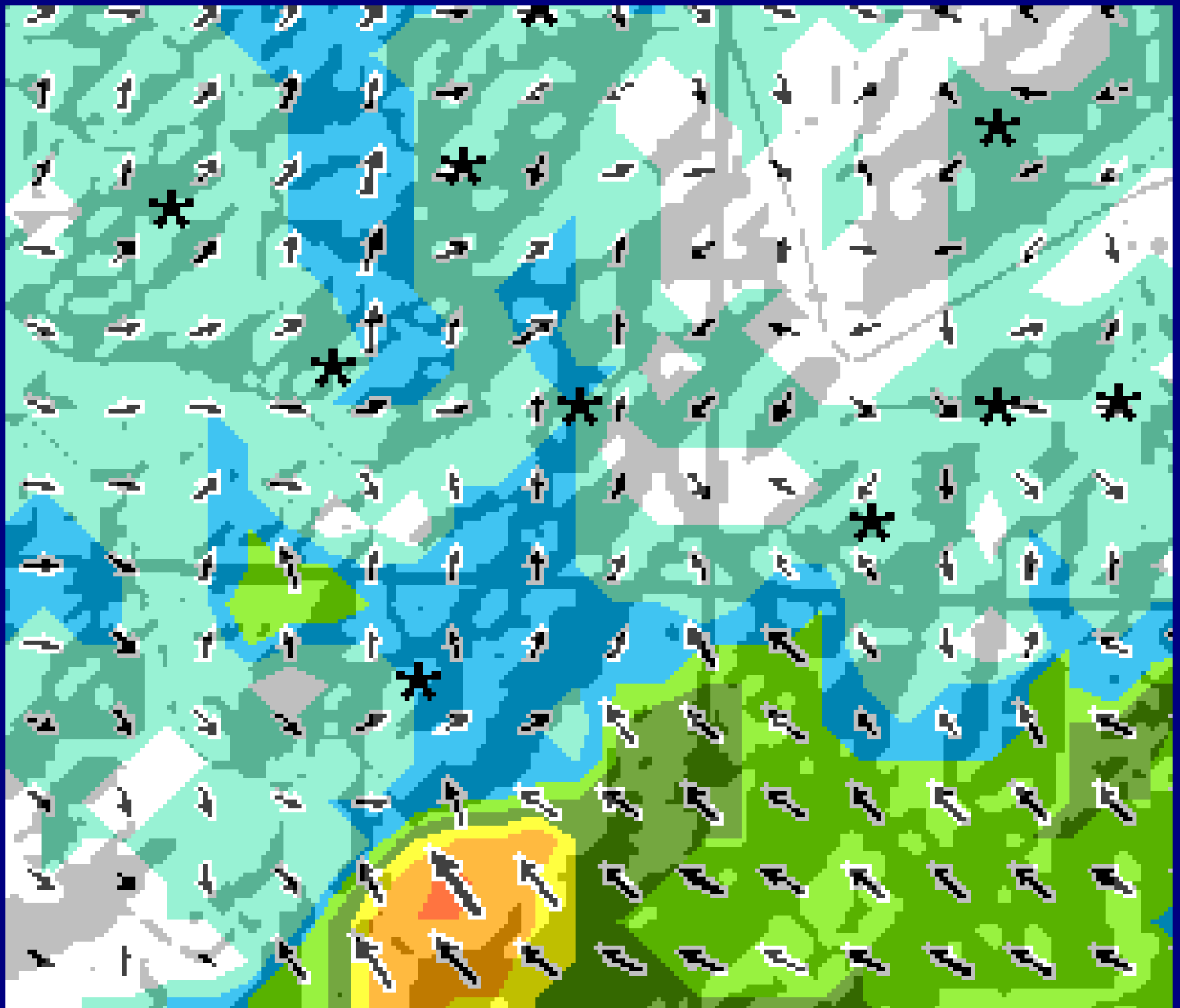
# BL average wind

Jean Oberson - soaringmeteo.ch - Valid on 2011\_9\_29\_THU\_ValidZ=\_1200, for WSA2K



Wind speed (truncated at 15) in m/s - Vectors at every even grid point





# Top CC

The diagram illustrates vertical profiles of wind speed in a canopy layer (CC) and the soil. It is divided into five horizontal layers. From top to bottom: 1. A thin cyan line representing the top of the canopy. 2. A light blue layer labeled 'Vents au top de la CC'. 3. A larger light blue layer labeled 'Vents moyens dans la CC'. 4. A light blue layer labeled 'Vents en surface du sol'. 5. A dark olive green layer labeled 'Sol'.

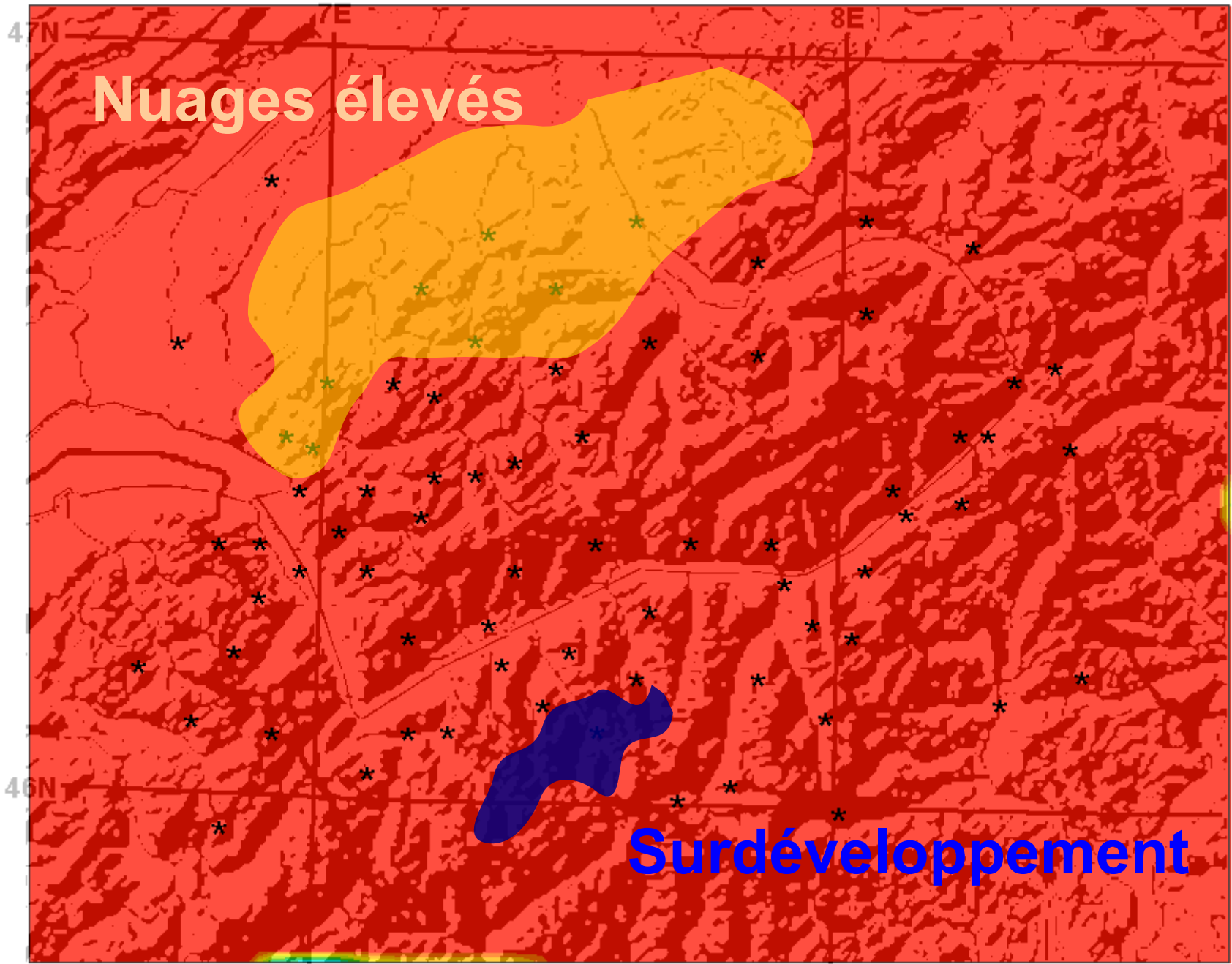
Vents au top de la CC

Vents moyens dans la CC

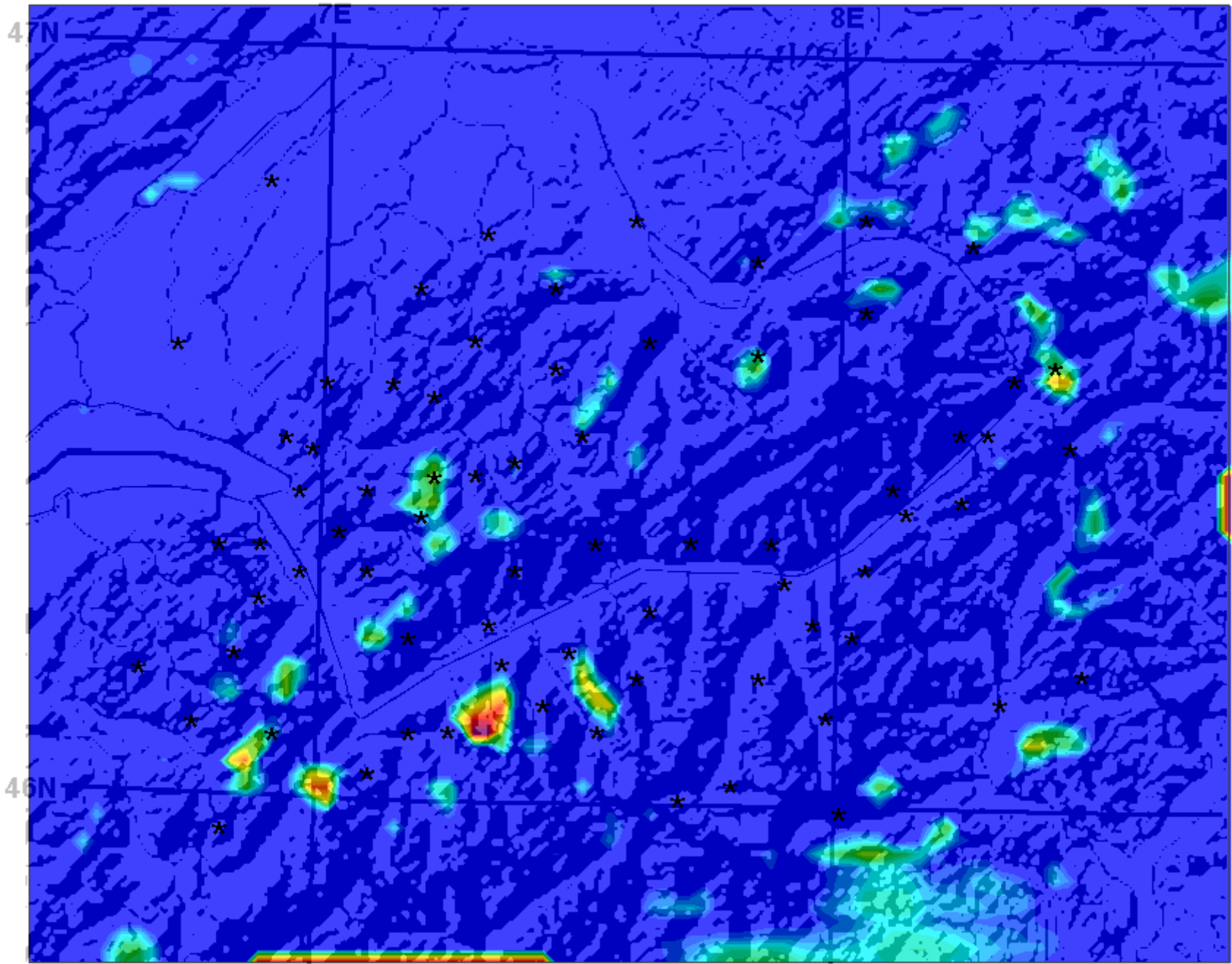
Vents en surface du sol

Sol

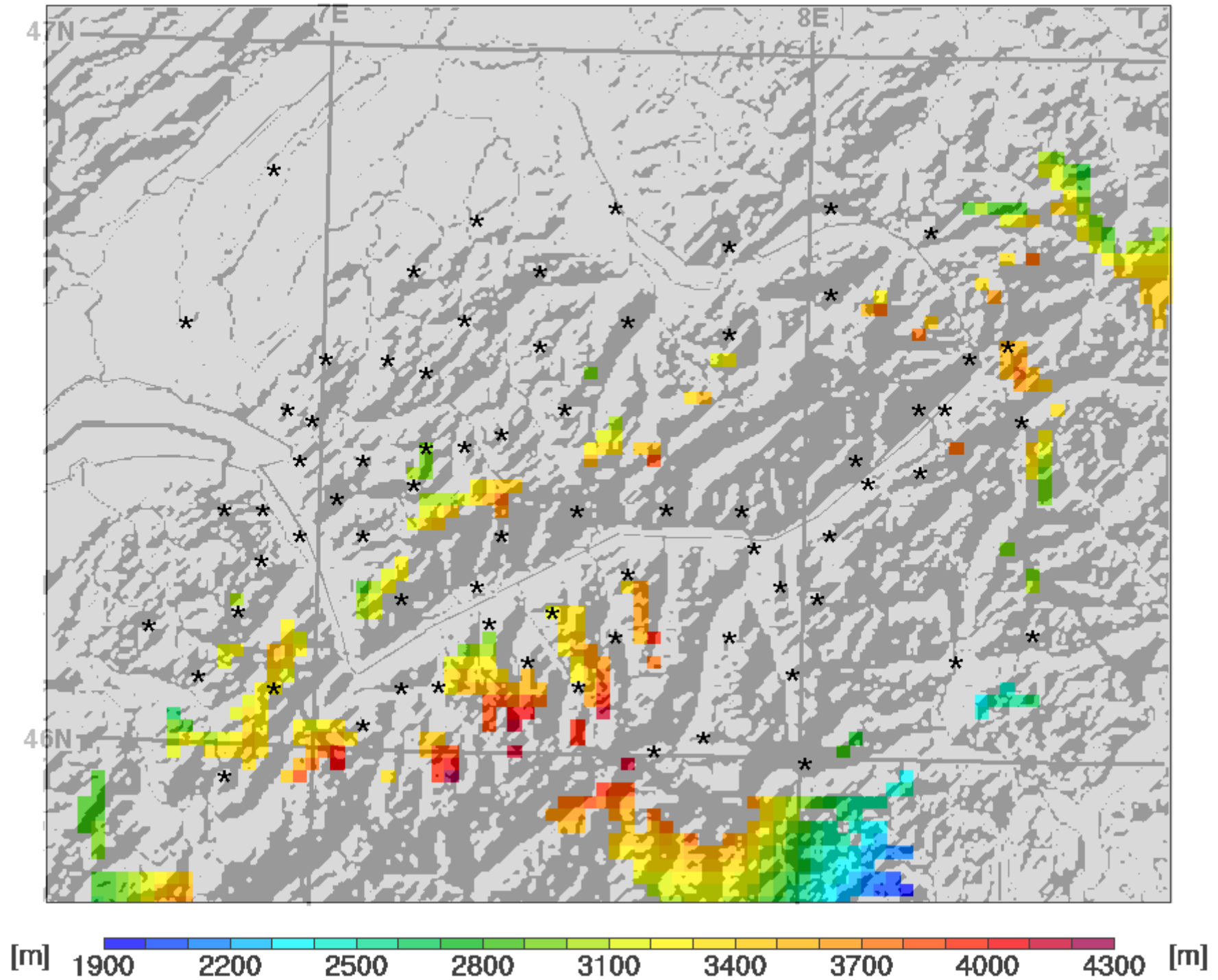
**Normalized Sfc. Solar Radiation**  
Valid 1200 UTC (1200Z) THU 29 Sep 2011 [24hrFcst@1809z]  
DrJack BLIPMAP from RASP 2.0km GFSN-initiated WRF-ARW model



**BL Cloud Cover**  
Valid 1200 UTC (1200Z) THU 29 Sep 2011 [24hrFcst@1809z]  
DrJack BLIPMAP from RASP 2.0km GFSN-initiated WRF-ARW model

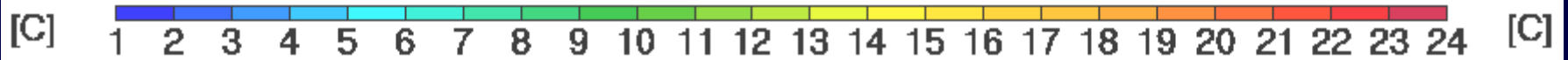
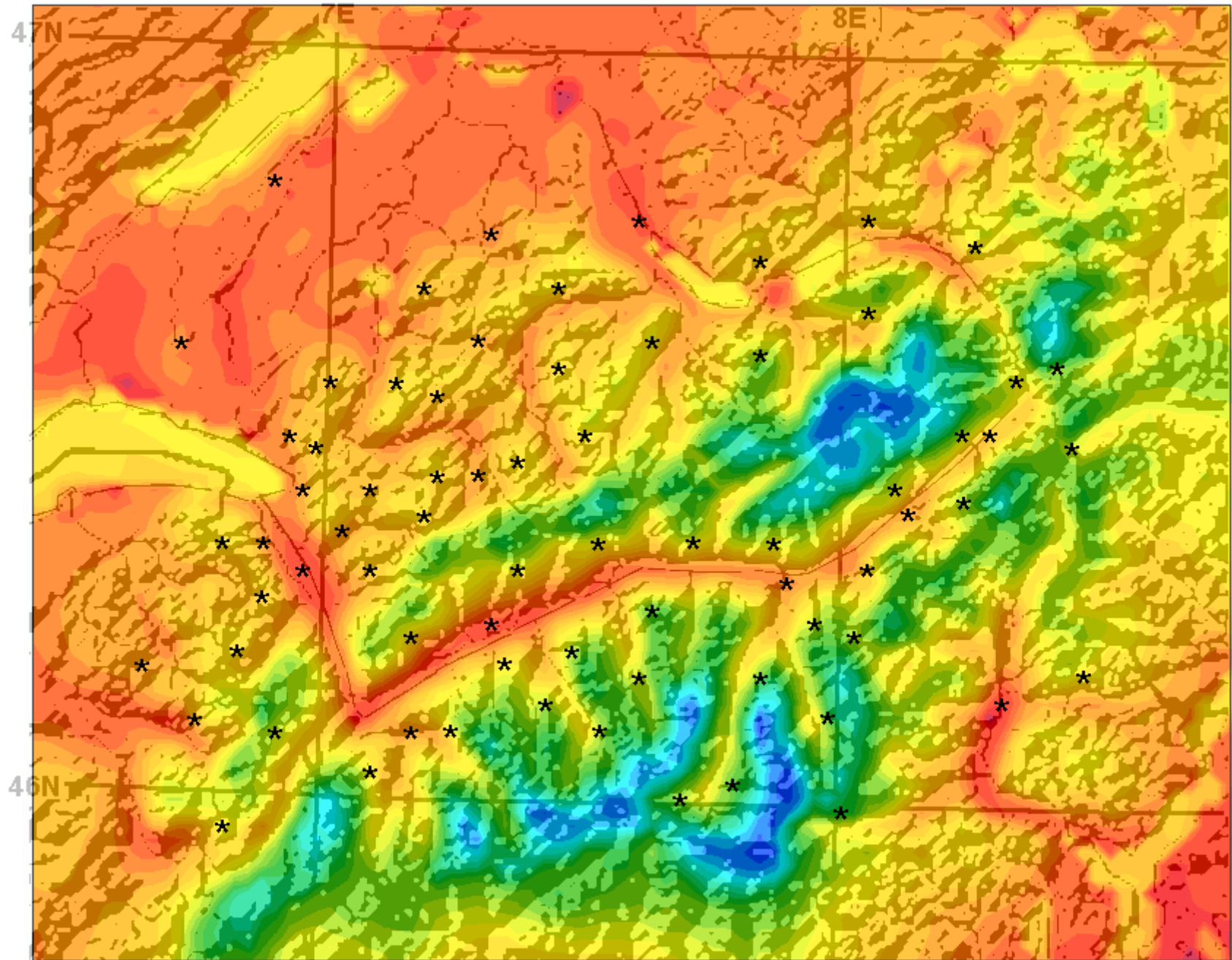


**Cu Cloudbase** where Cu Potential > 0  
Valid 1200 UTC (1200Z) THU 29 Sep 2011 [24hrFcst@1809z]



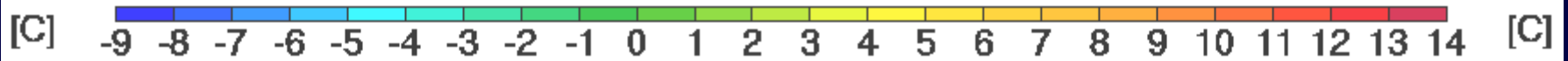
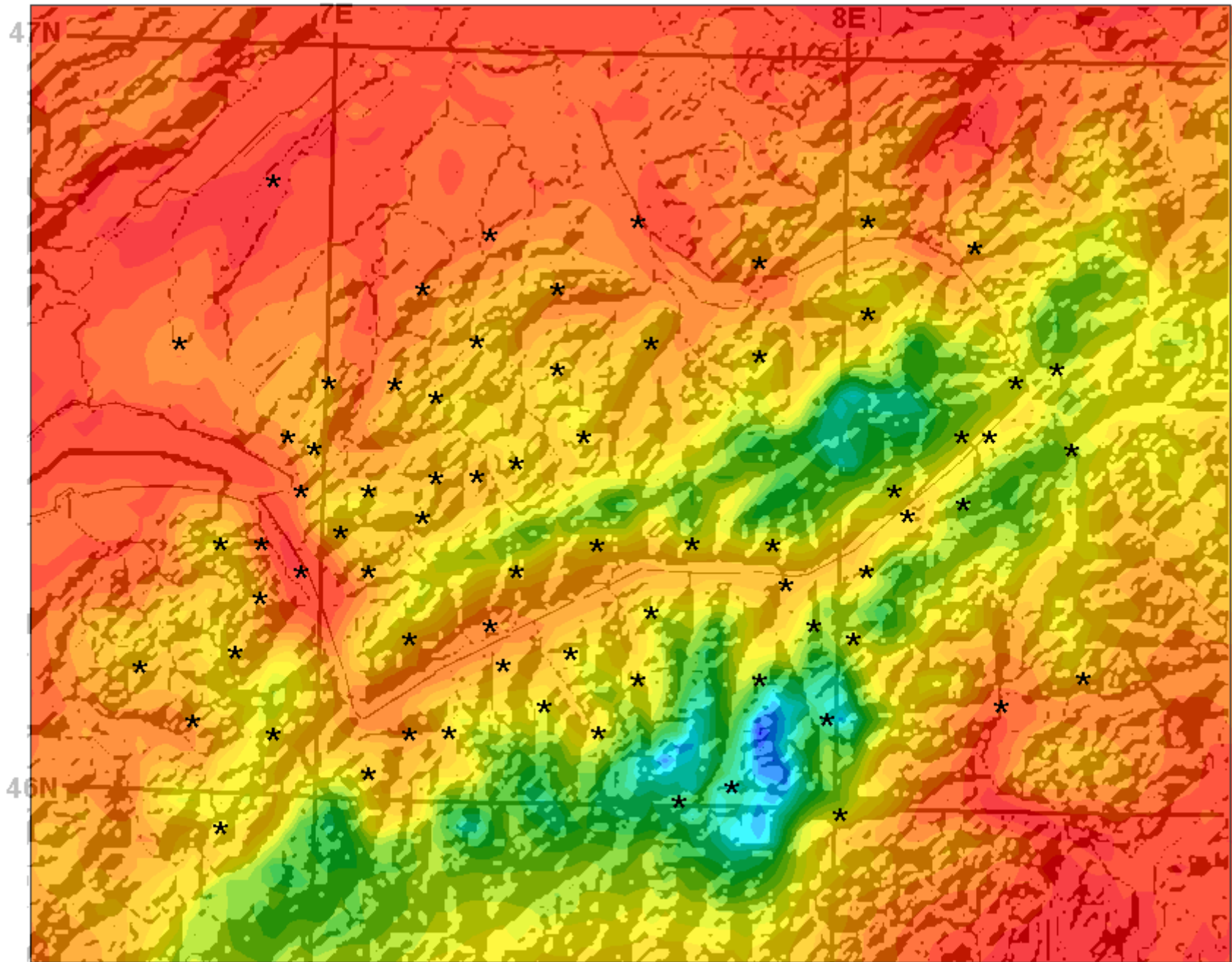


**Surface Temperature (2m AGL)**  
Valid 1200 UTC (1200Z) THU 29 Sep 2011 [24hrFcst@1809z]  
DrJack BLIPMAP from RASP 2.0km GFSN-initiated WRF-ARW model





**Surface Dew Point Temperature (2m AGL)**  
Valid 1200 UTC (1200Z) THU 29 Sep 2011 [24hrFcst@1809z]  
DrJack BLIPMAP from RASP 2.0km GFSN-initiated WRF-ARW model



CAPE : Convective Available Potential  
Energy en J/Kg (d'air = env. 1 m<sup>3</sup>)

Convective ici = orage

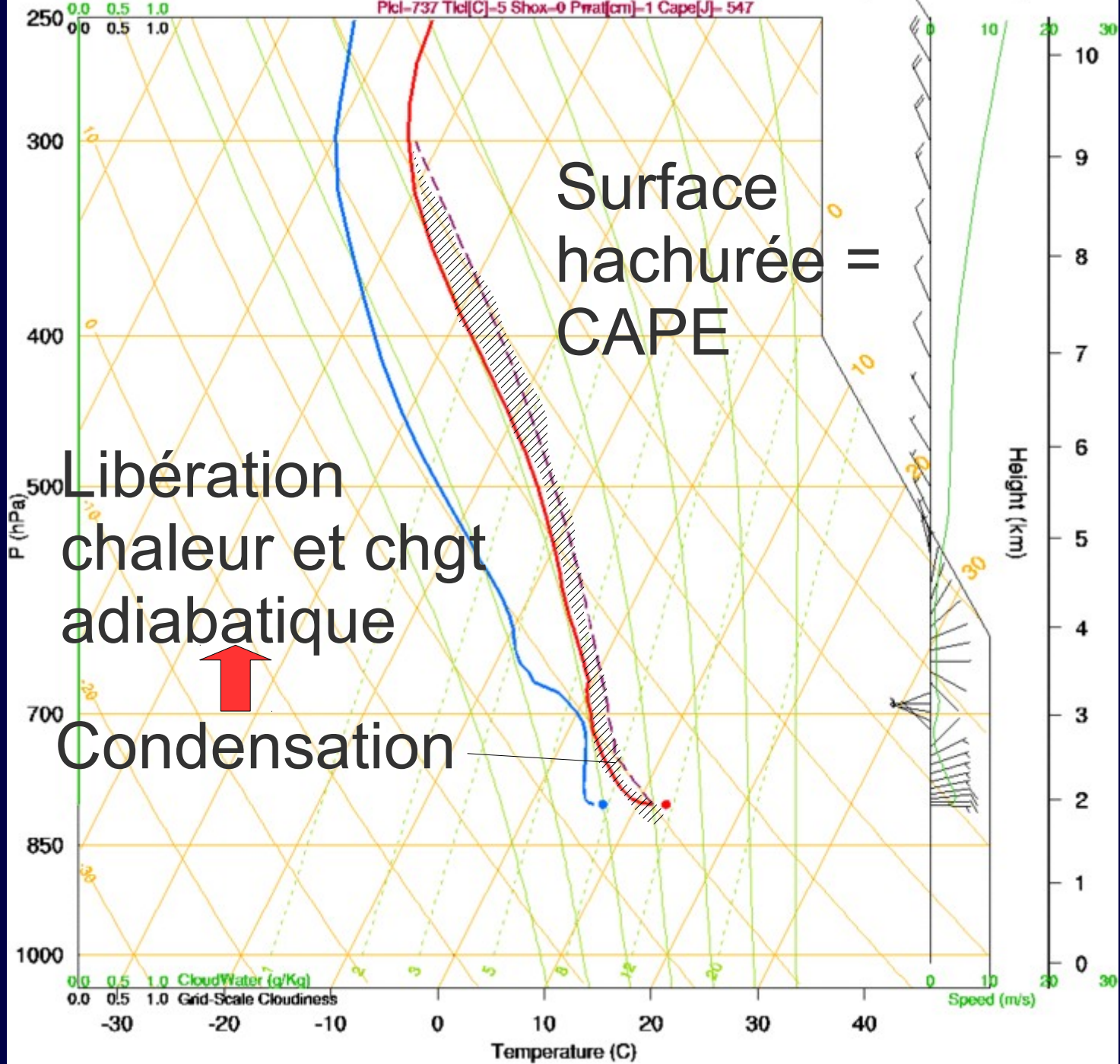
Energie potentielle = Energie de réserve

Air humide et chaud possède de l'énergie  
potentiel car si sa vapeur d'eau se condense  
=> libération de chaleur

CAPE = mesure tendance orageuse : 0 =  
none, 300-1000 = weak, 1000-2500 =  
moderate, 2500-5300 = strong.

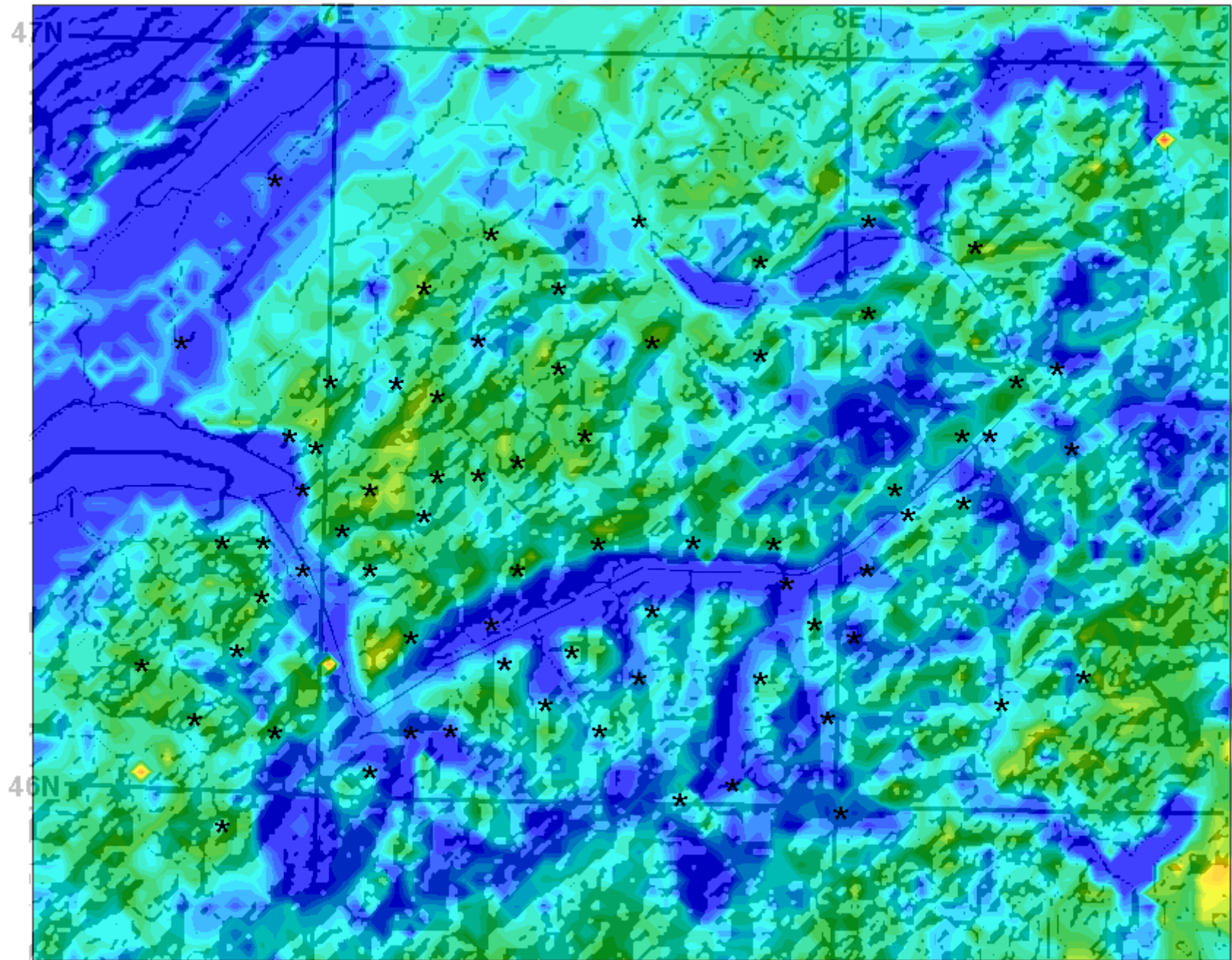
#60: Gsur 46.49°,7.5° (42,40) Valid 1200 UTC (1200Z) FRI 29 Jul 2011 [24hrFcast@1812z]

Pcl-737 Tcl[C]-5 Shox-0 Prra[cm]-1 Cape[J]- 547





**CAPE**  
Valid 1200 UTC (1200Z) FRI 29 Jul 2011 [24hrFcst@1812z]  
DrJack BLIPMAP from RASP 2.0km GFSN-initiated WRF-ARW model

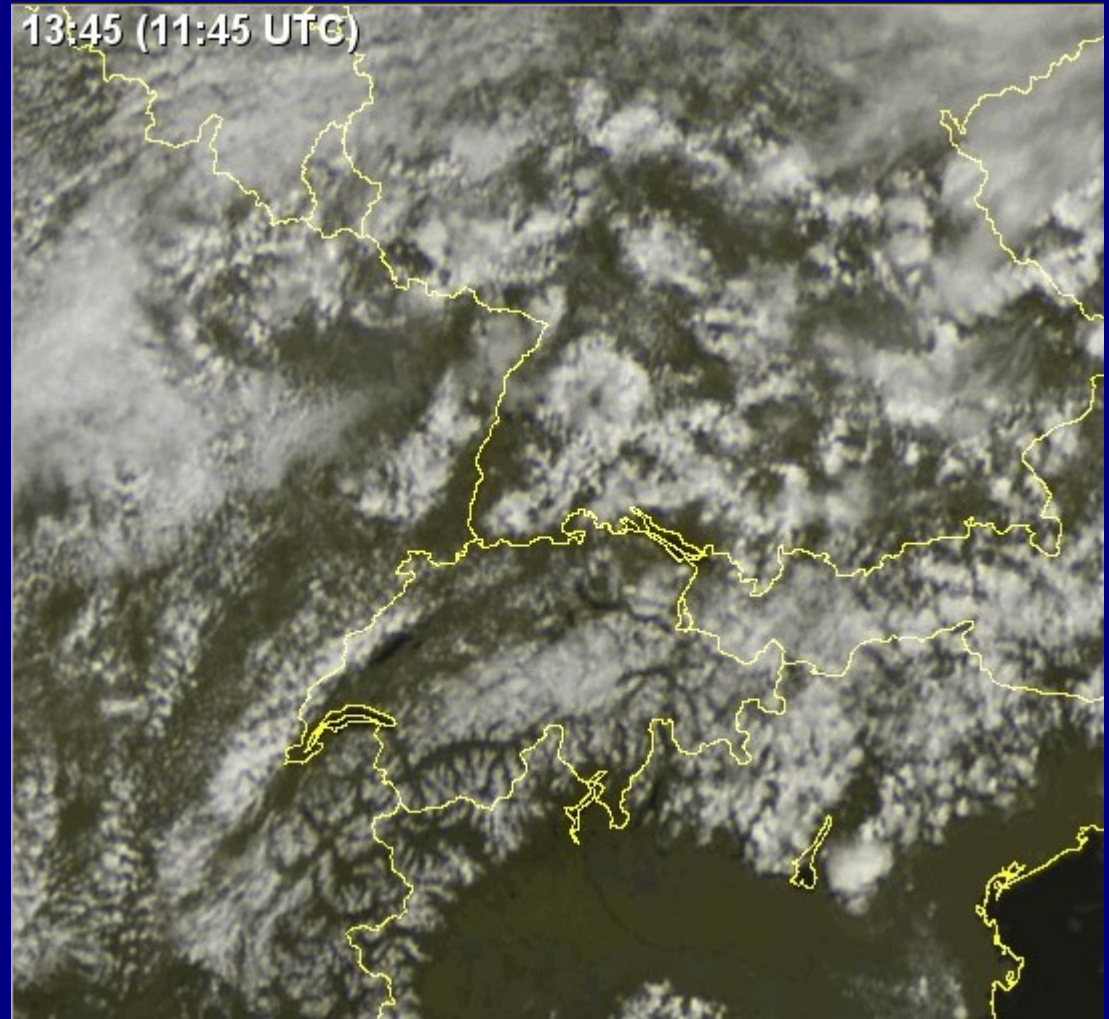


07/29/2011 16:55

Le Nouvelliste



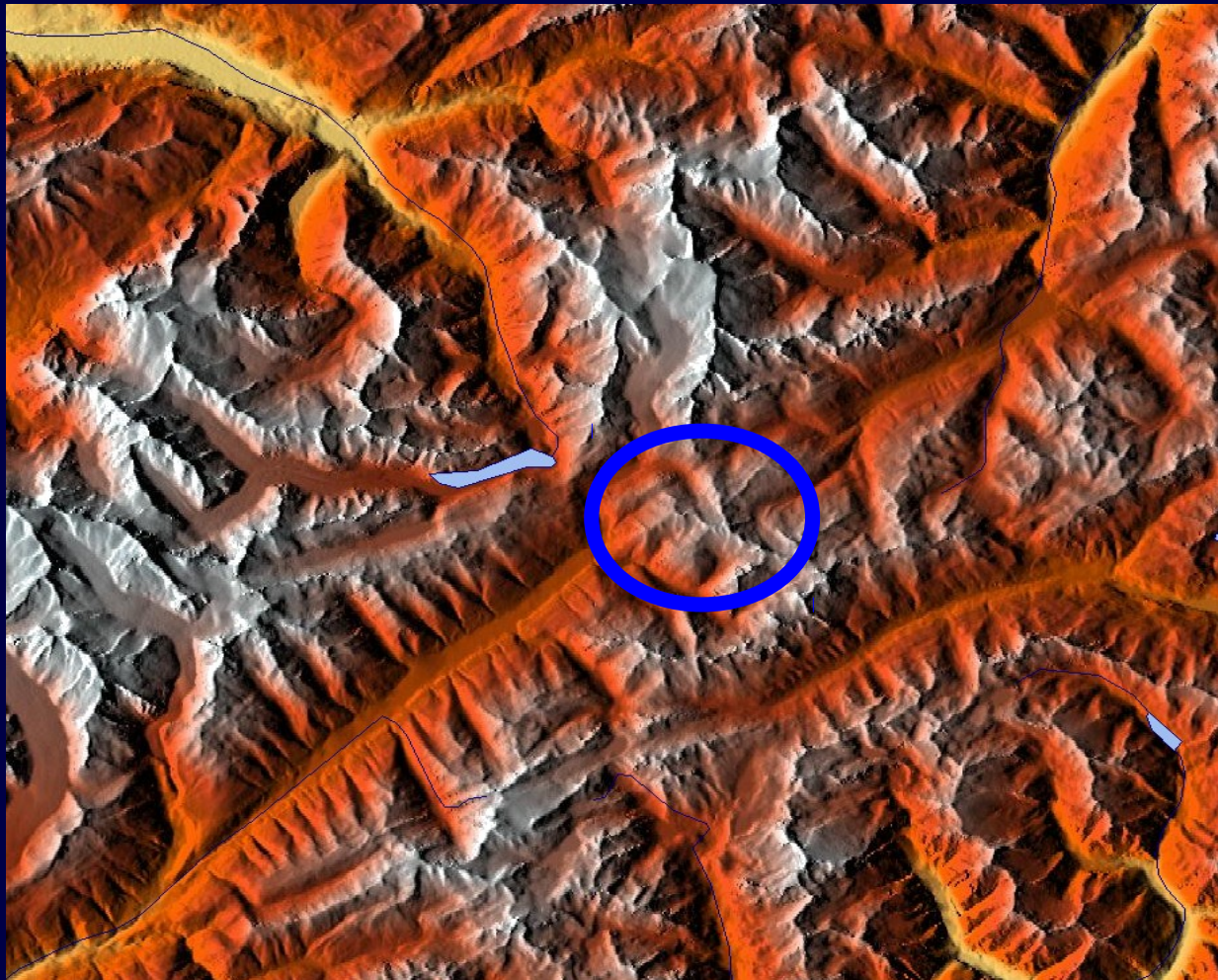
13:45 (11:45 UTC)



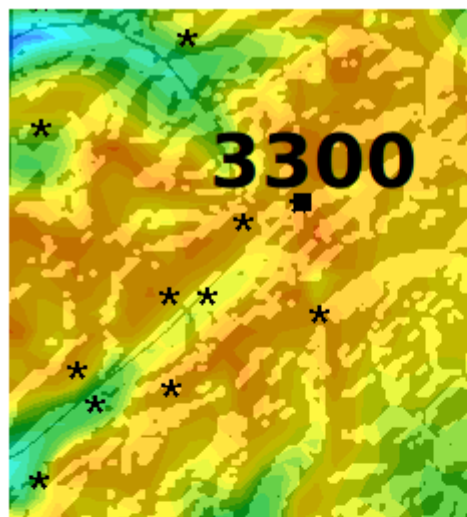


## Exercice no2

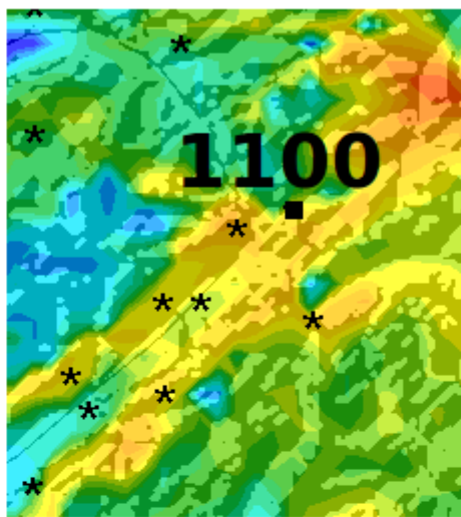
Estimer le profil aérologique de la Furka à partir des cartes HBL, DBL, T, bases des cumulus, insolation, CAPE.



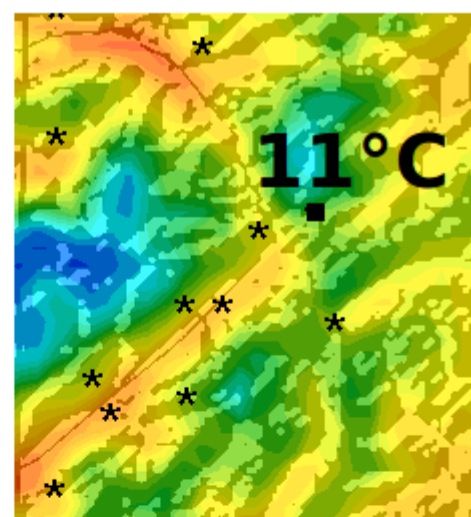
# Top CC



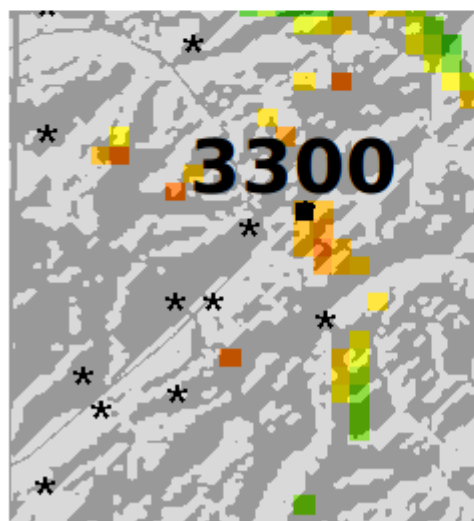
# Epaisseur CC



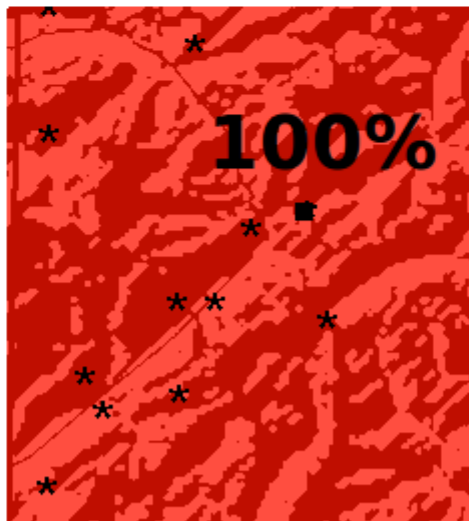
# T



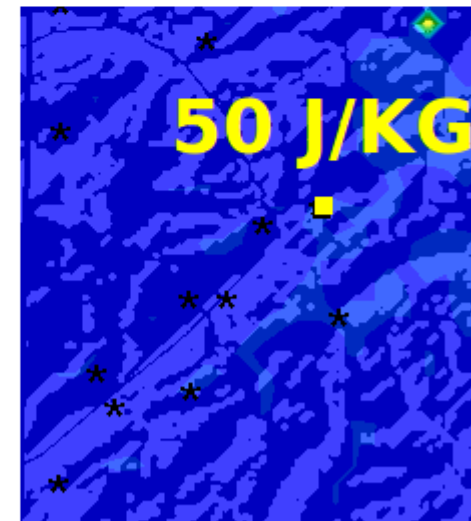
# Cu base



# Soleil



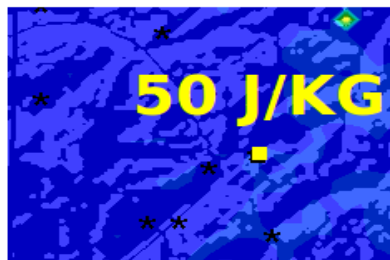
# CAPE



29 sept 2011 12Z

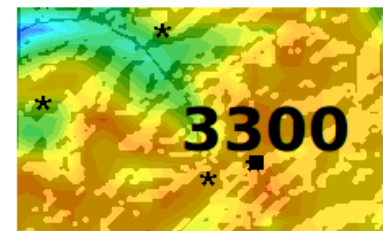


# CAPE

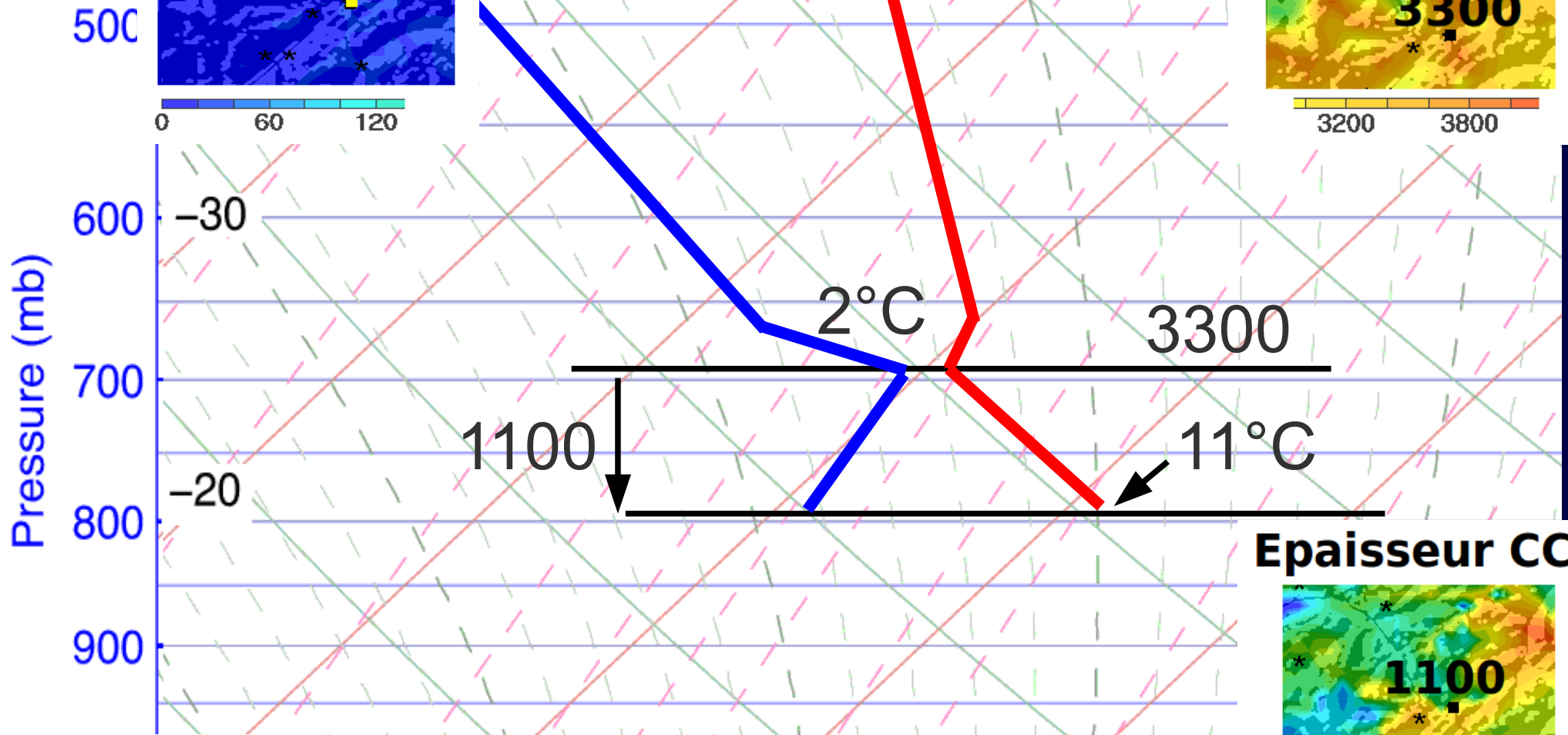


0 60 120

# Top CC



3200 3800



Pressure (mb)

-30

-20

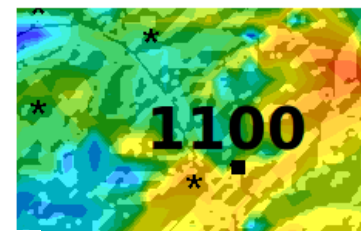
2°C

3300

1100

11°C

# Epaisseur CC

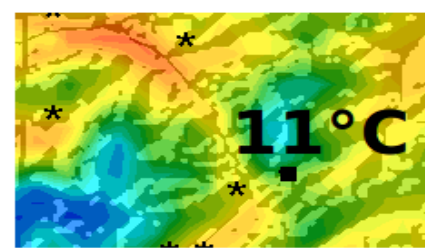


1000 1200 1400

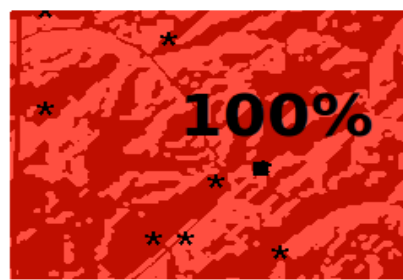
# T

# Soleil

# Cu base

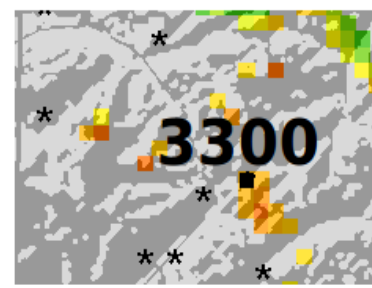


11 12 13 14 15



90 95 100

10  
Temperature (°C)

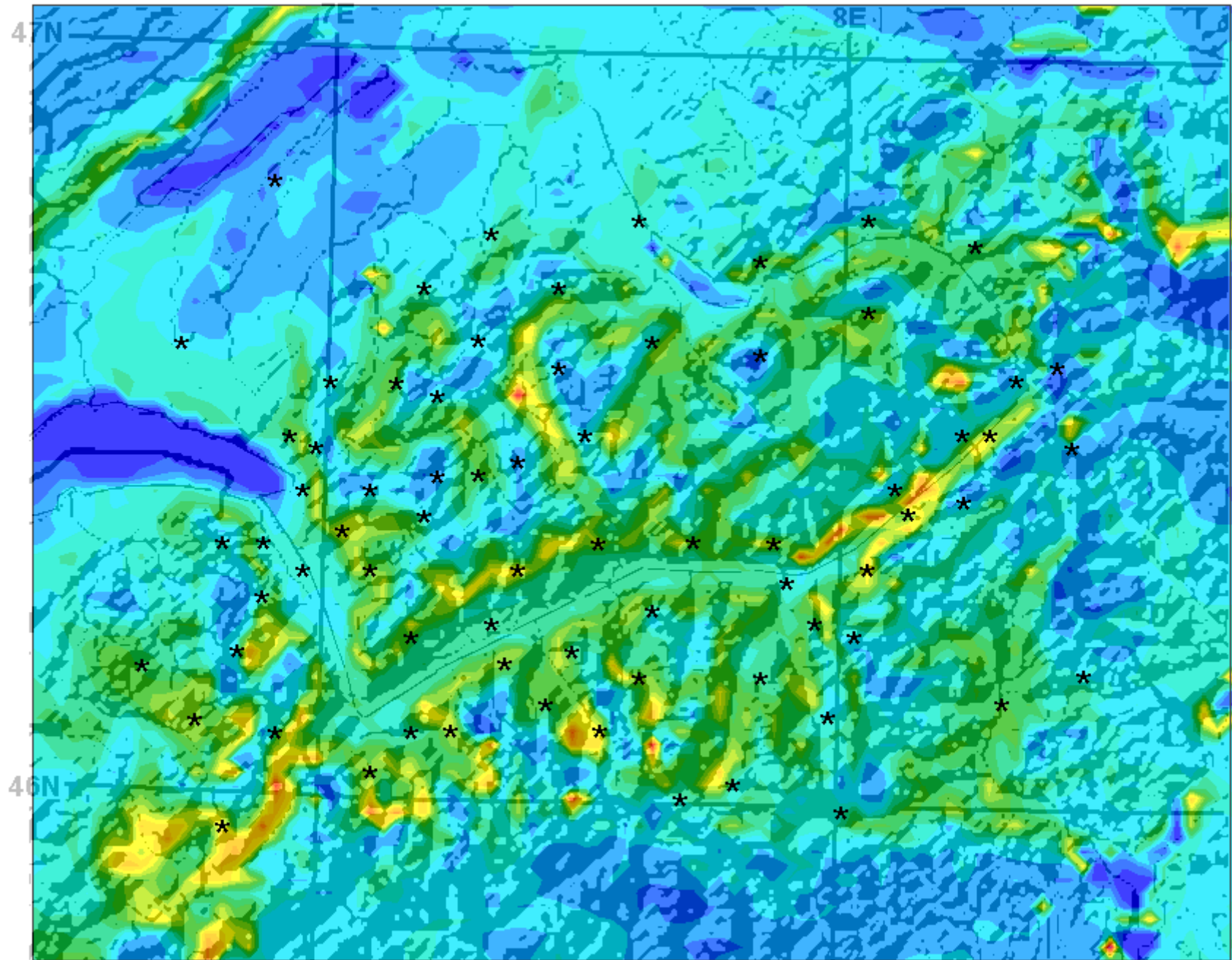


3100 3700

30



**BL Top Uncertainty/Variability (for +1degC)**  
Valid 1200 UTC (1200Z) THU 29 Sep 2011 [24hrFcst@1809z]  
DrJack BLIPMAP from RASP 2.0km GFSN-initiated WRF-ARW model



$W^*$  = vitesse ascendantes des thermiques  
dépend de :

- Épaisseur de la CC
- Chaleur sensible au sol 

```
graph LR; A[Chaleur sensible au sol] --> B[Humidité au sol]; A --> C[Insolation]
```

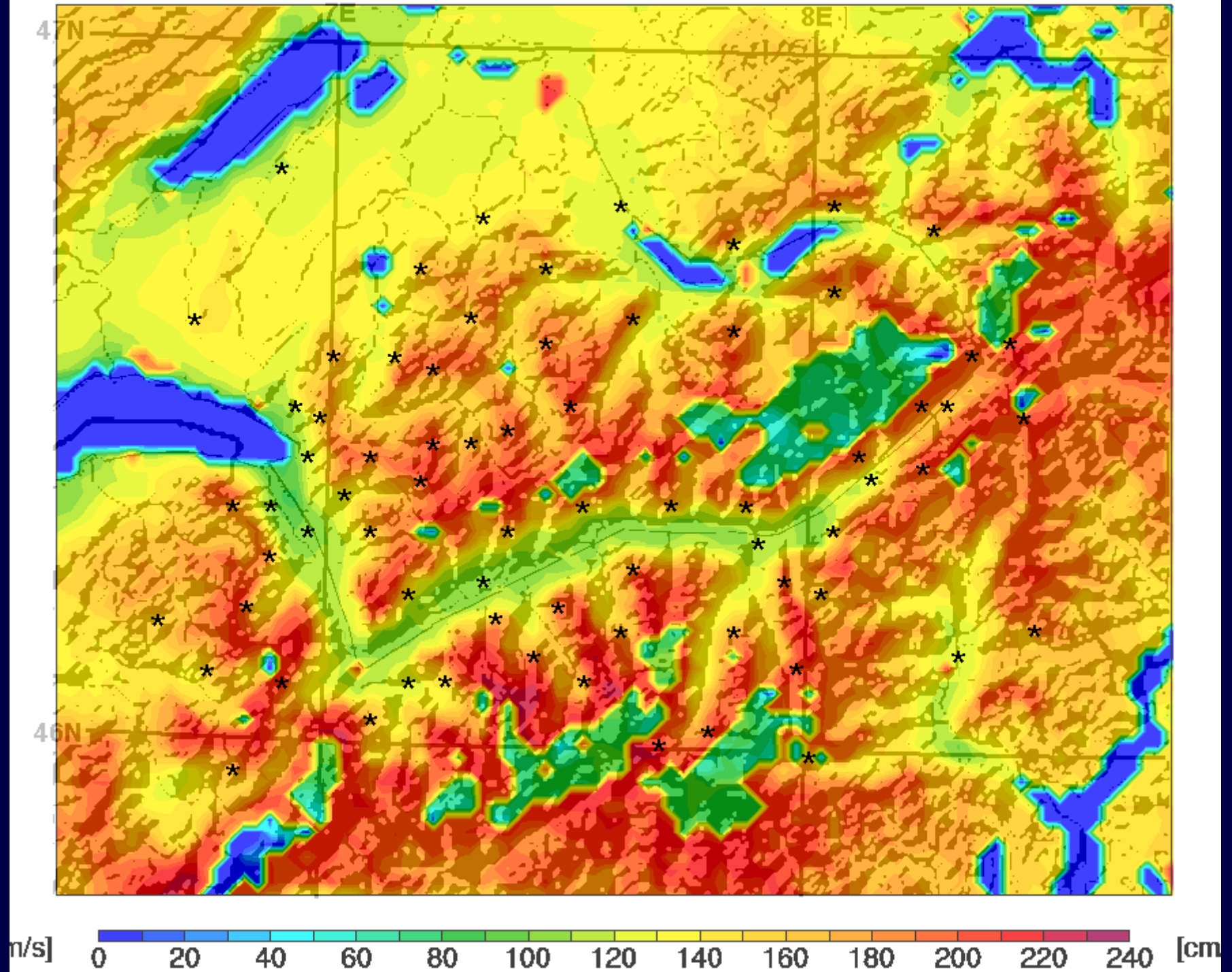
Présence de cumulus => vitesse ascendante  
réelle >  $W^*$  (effet de succion des cu) !!!

Attention à l'interprétation : 2 pièges !!!



# Thermal Updraft Velocity ( $W^*$ )

Valid 1200 UTC (1200Z) THU 29 Sep 2011 [24hrFcst@1809z]  
DrJack BLIPMAP from RASP 2.0km GFSN-initiated WRF-ARW model



B / S Ratio =

Buoyancy / Shear Ratio =

Rapport Flottabilité / Cisaillement

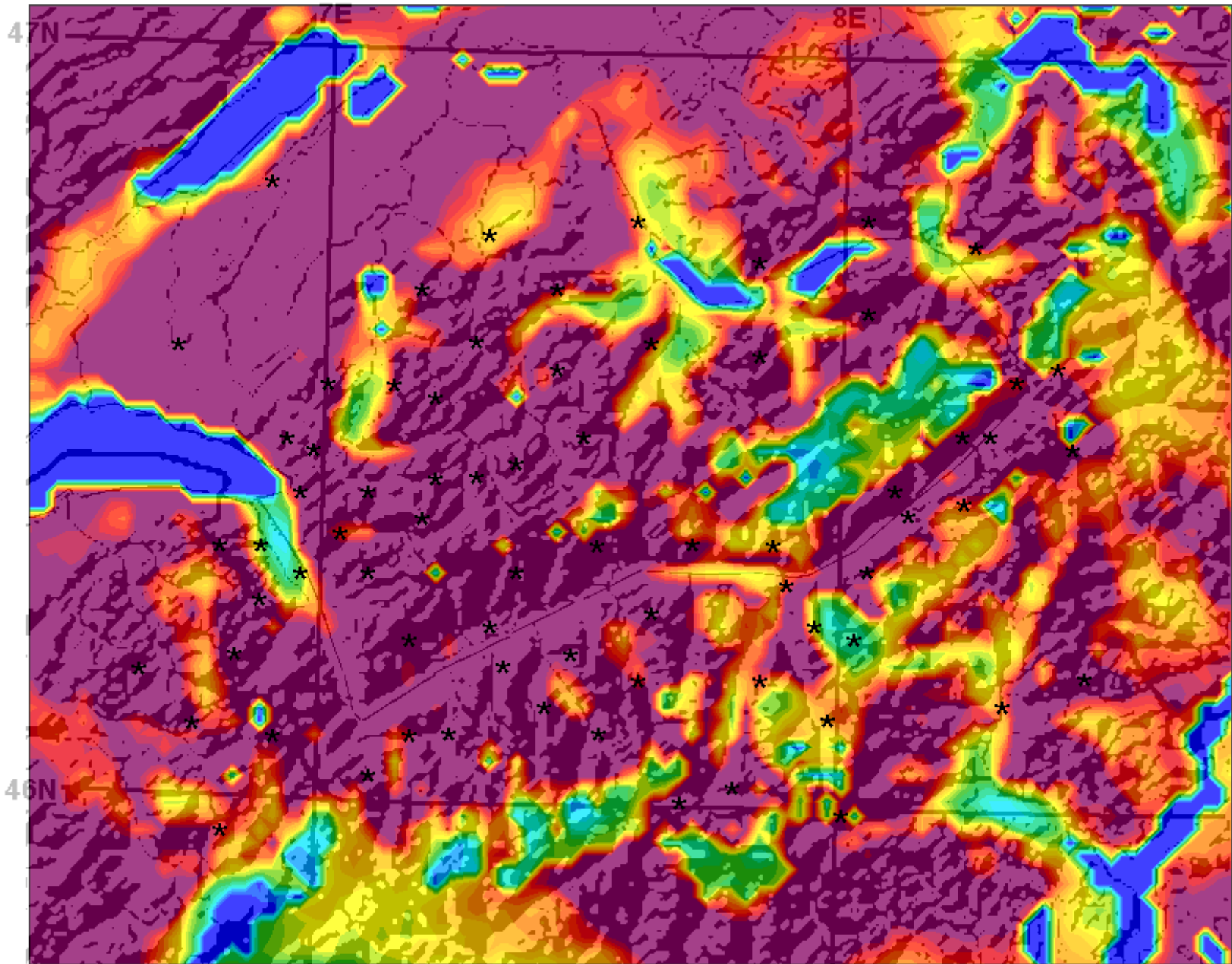
Rapport élevé si B élevé et S faible.

Rapport élevé => bons thermiques, bien organisés.

**Conclusions : BSR = mesure de la qualité des thermiques.**

0 = impraticables, 10 = médiocres 15-20 = bons

**Buoyancy/Shear Ratio**  
Valid 1200 UTC (1200Z) THU 29 Sep 2011 [24hrFcst@1809z]  
DrJack BLIPMAP from RASP 2.0km GFSN-initiated WRF-ARW model

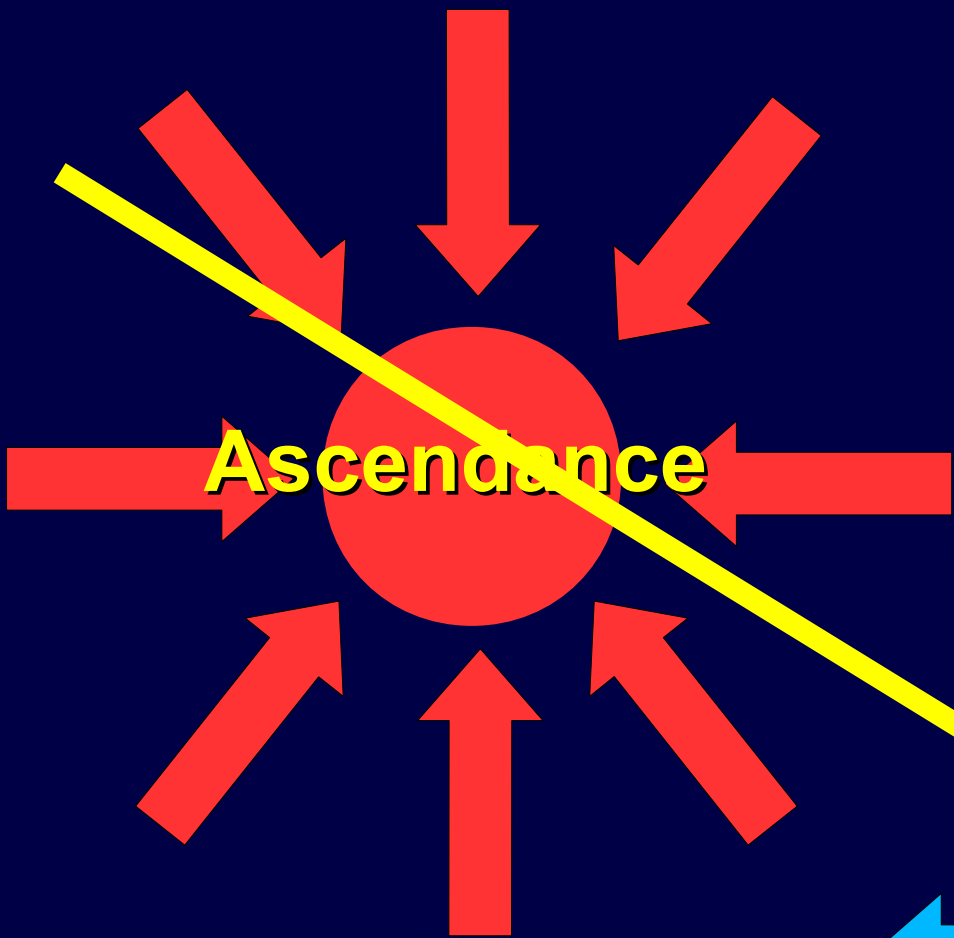


ated  
20

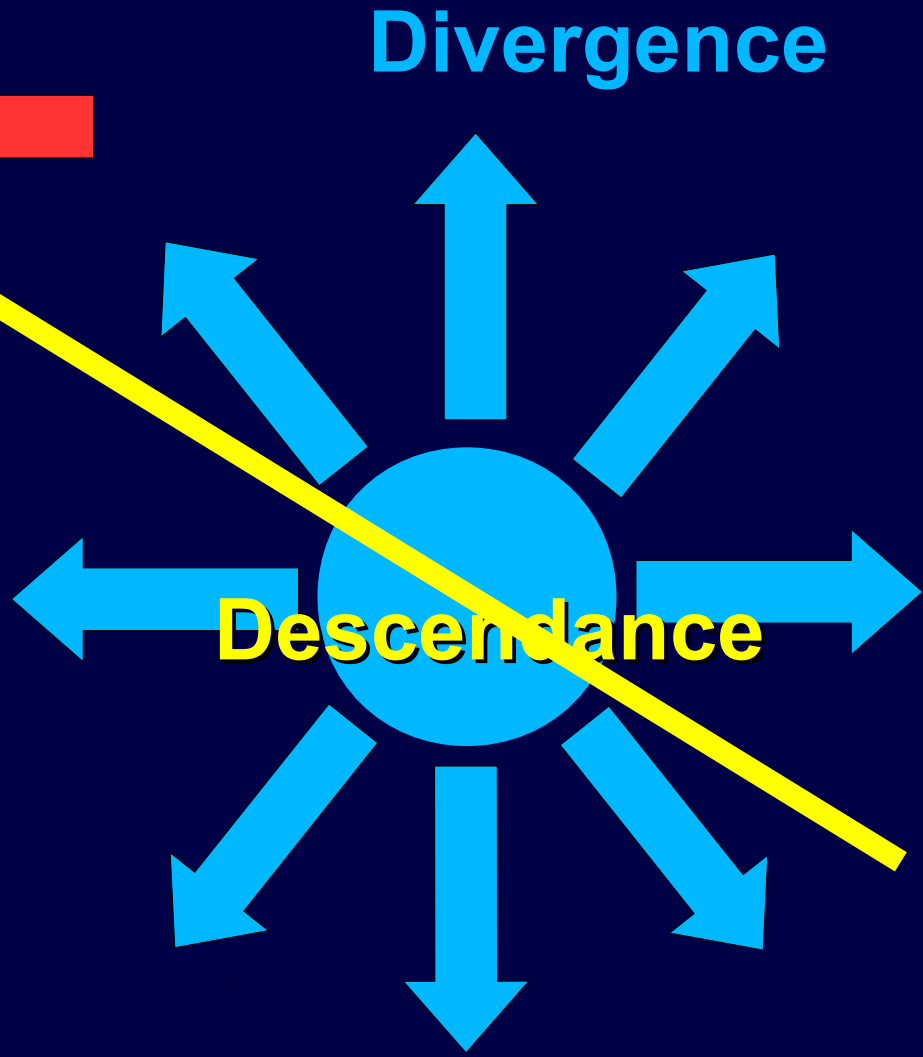


Trunc  
at 2



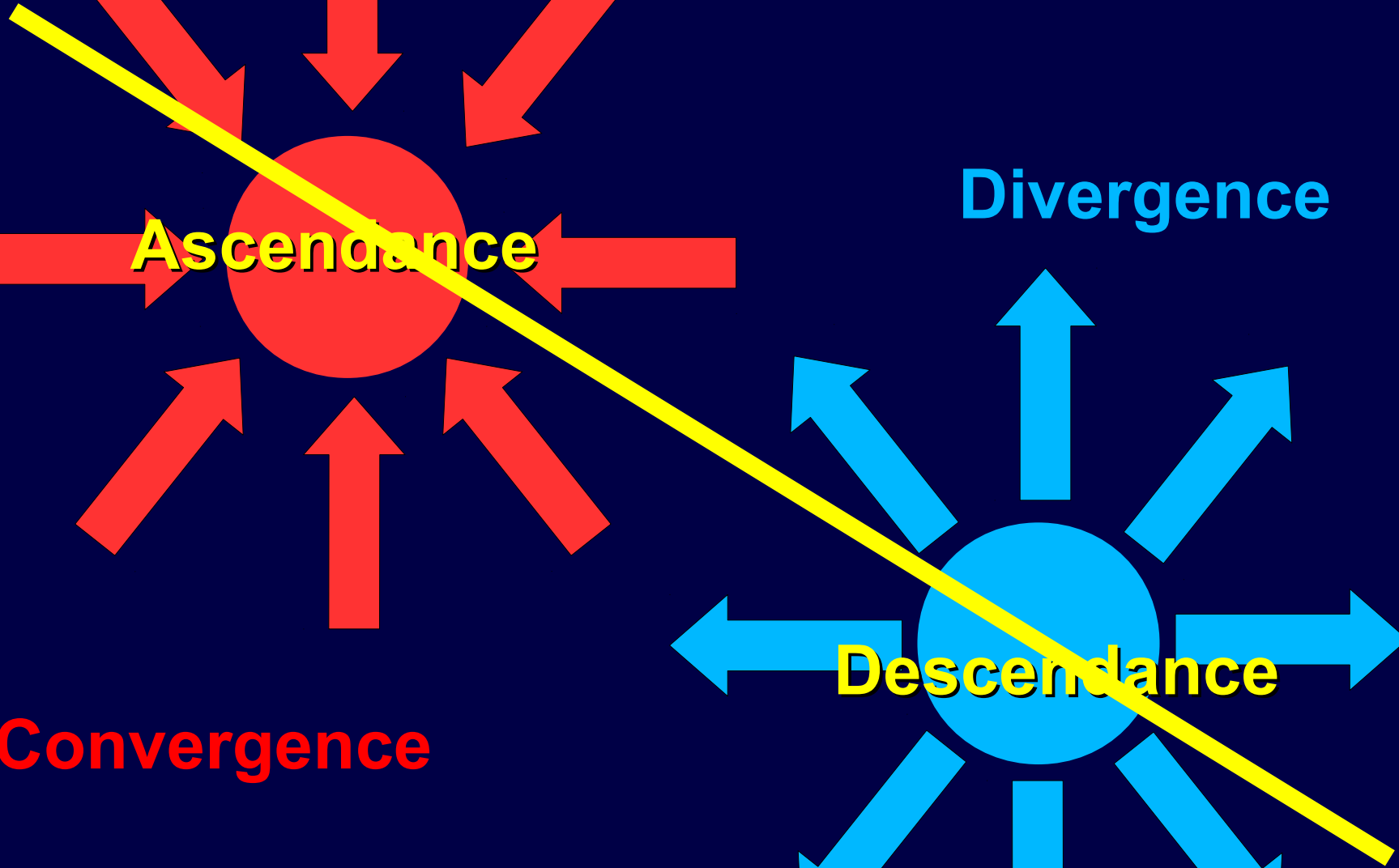


**Convergence**



**Divergence**

**Descendance**



**Divergence**

**Convergence**

**Ascendance**

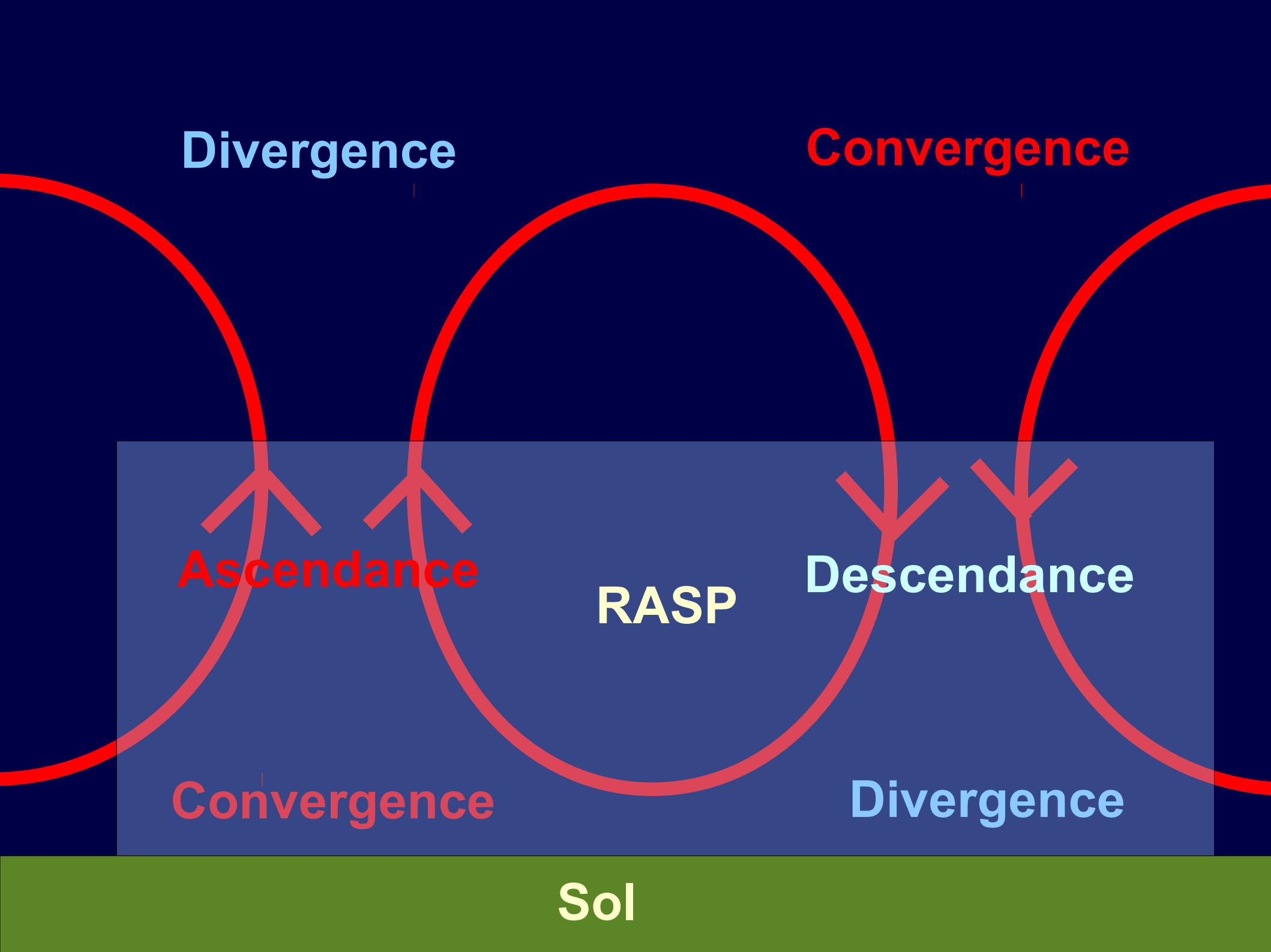
**RASP**

**Descendance**

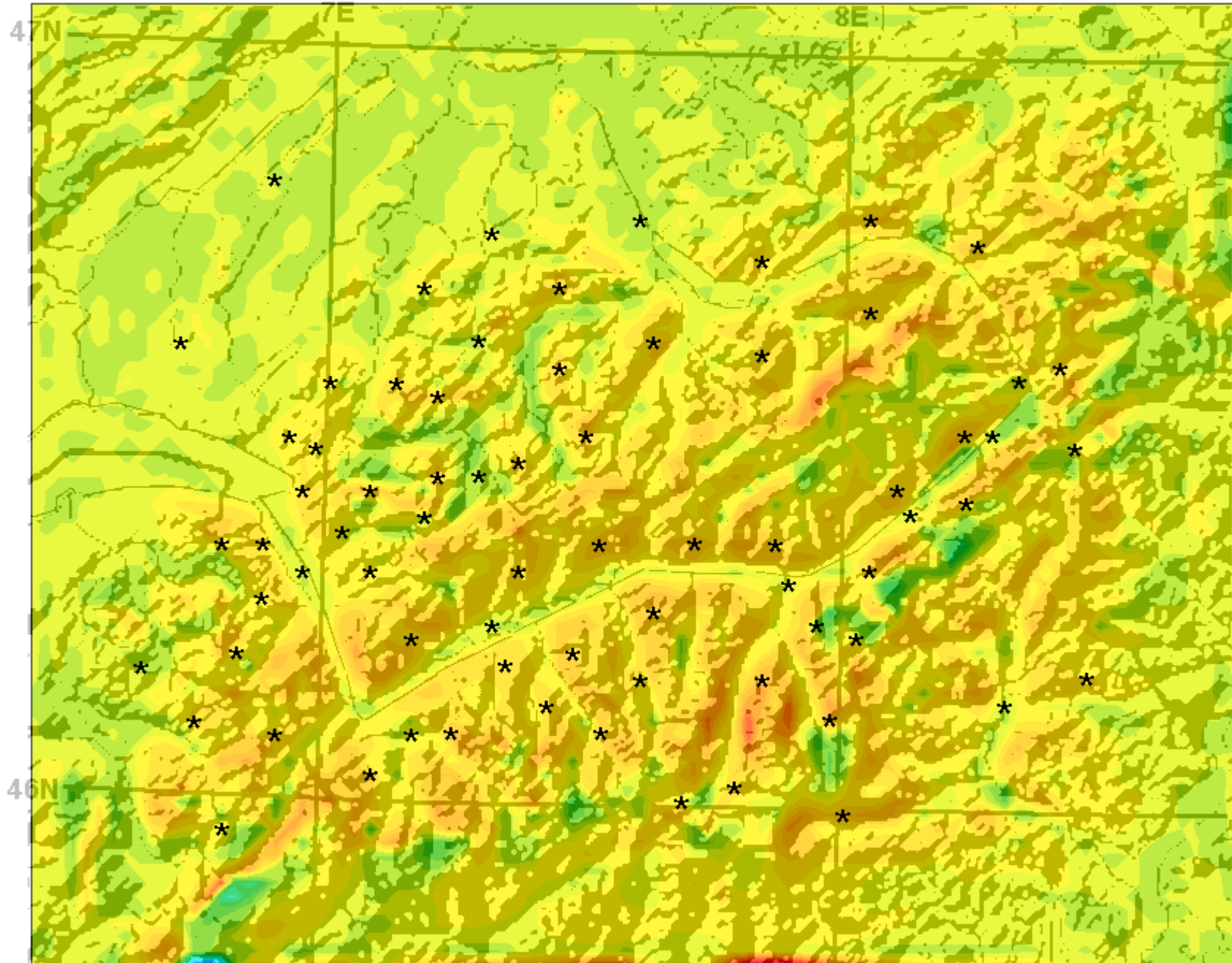
**Convergence**

**Divergence**

**Sol**



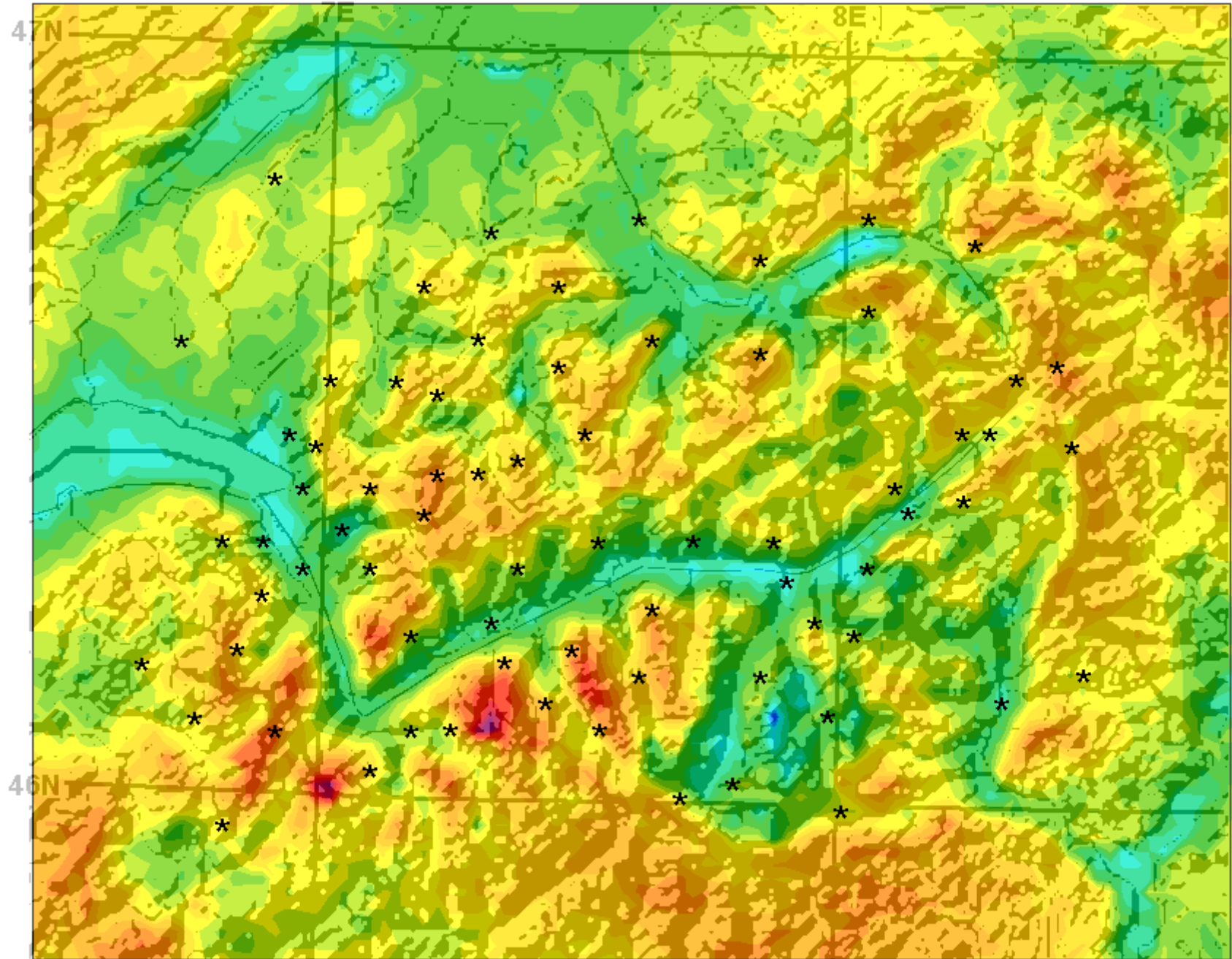
**BL Max. Up/Down Motion**  
Valid 1200 UTC (1200Z) THU 29 Sep 2011 [24hrFcst@1809z]  
Dr.Jack BLIPMAP from RASP 2.0km GFSN-initiated WRF-ARW model



m/s] -240 -180 -120 -60 0 60 120 180 240 [cm/s]

# Overcast Development Potential

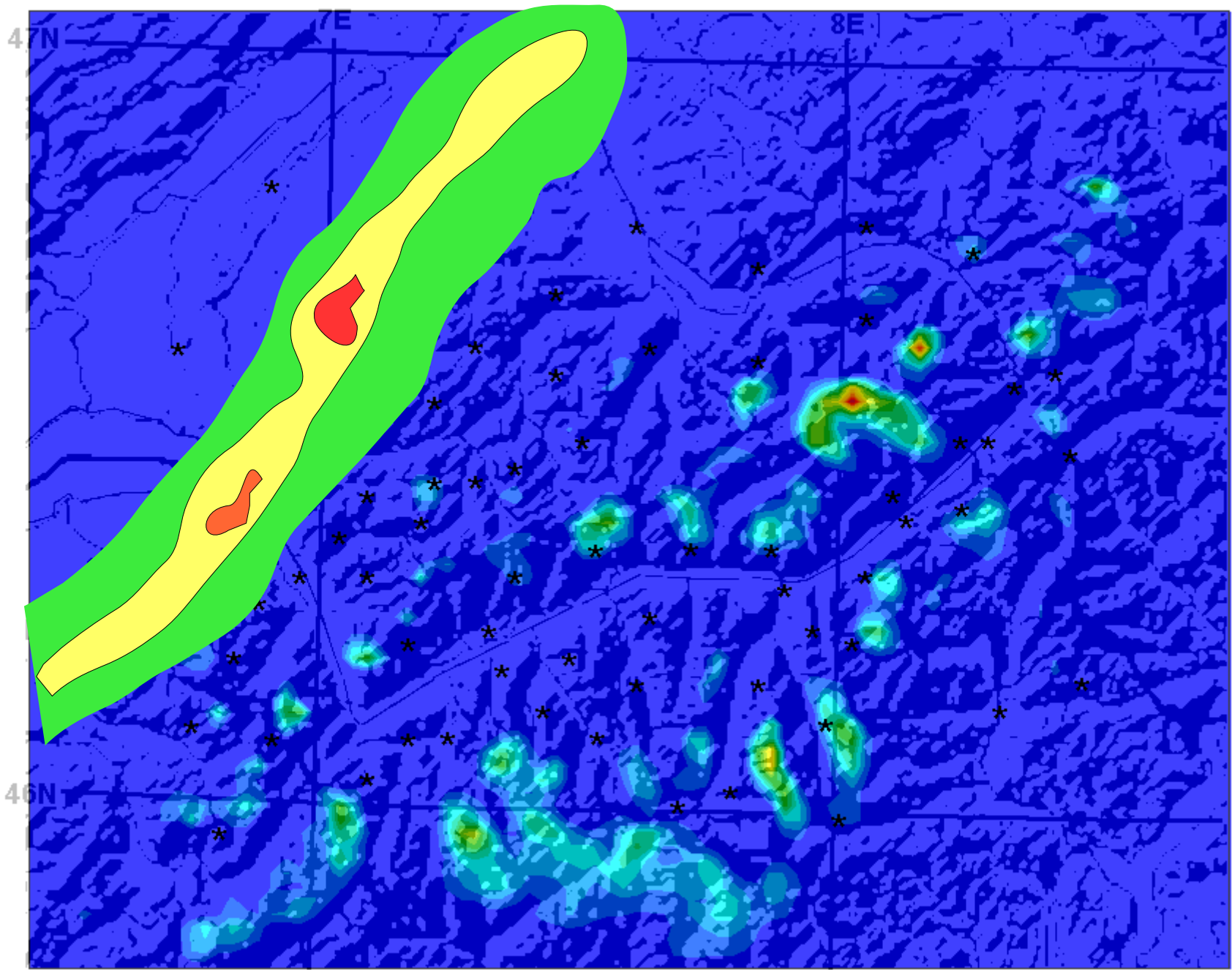
Valid 1200 UTC (1200Z) THU 29 Sep 2011 [24hrFcst@1809z]  
DrJack BLIPMAP from RASP 2.0km GFSN-initiated WRF-ARW model



[m] -3600 -3000 -2400 -1800 -1200 -600 0 [m]

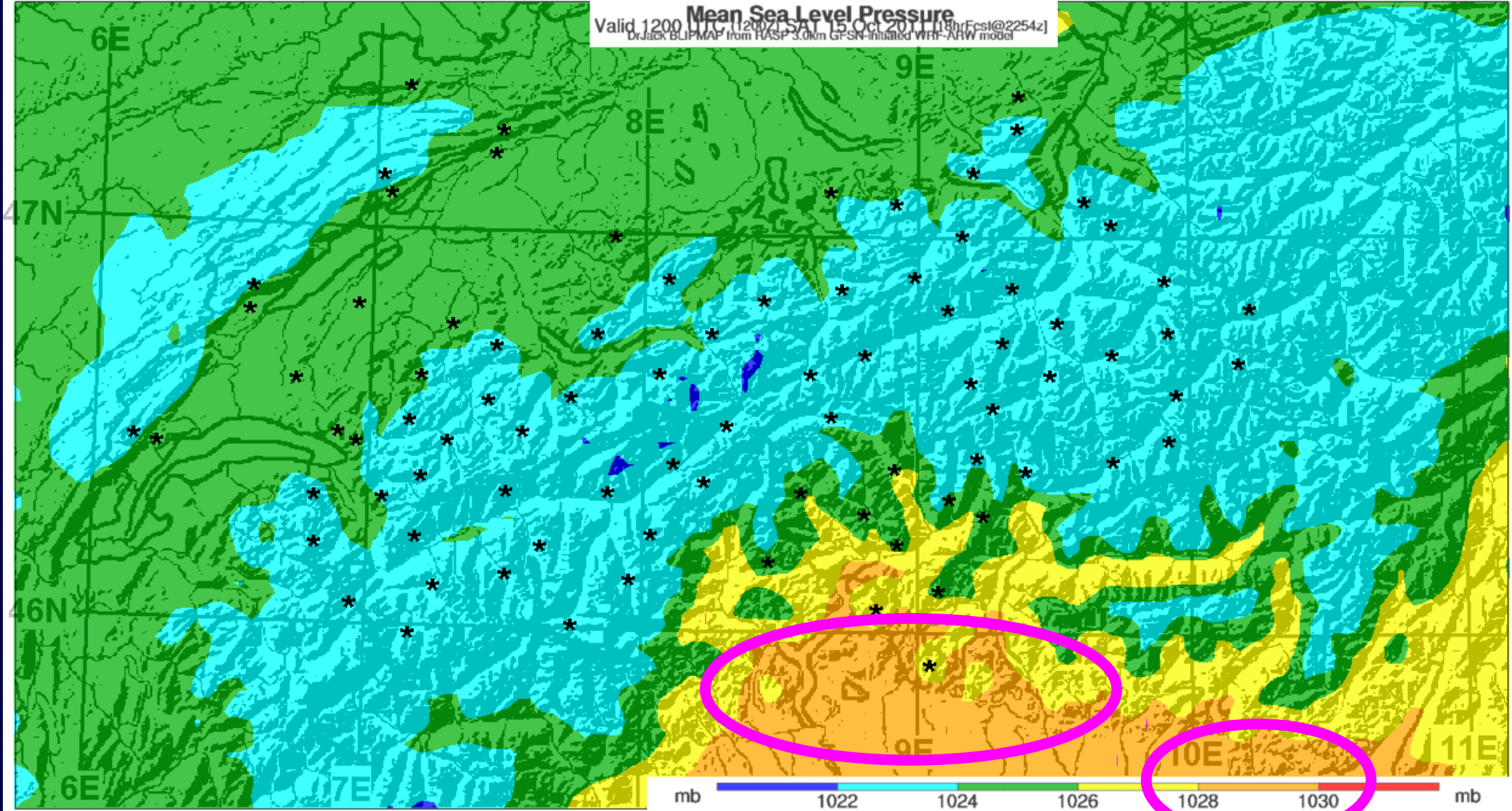


**3h accumulated total precipitation**  
Valid 1500 UTC (1500Z) FRI 29 Jul 2011 [27hrFcst@1831z]  
DrJack BLIPMAP from RASP 2.0km GFSN-initiated WRF-ARW model



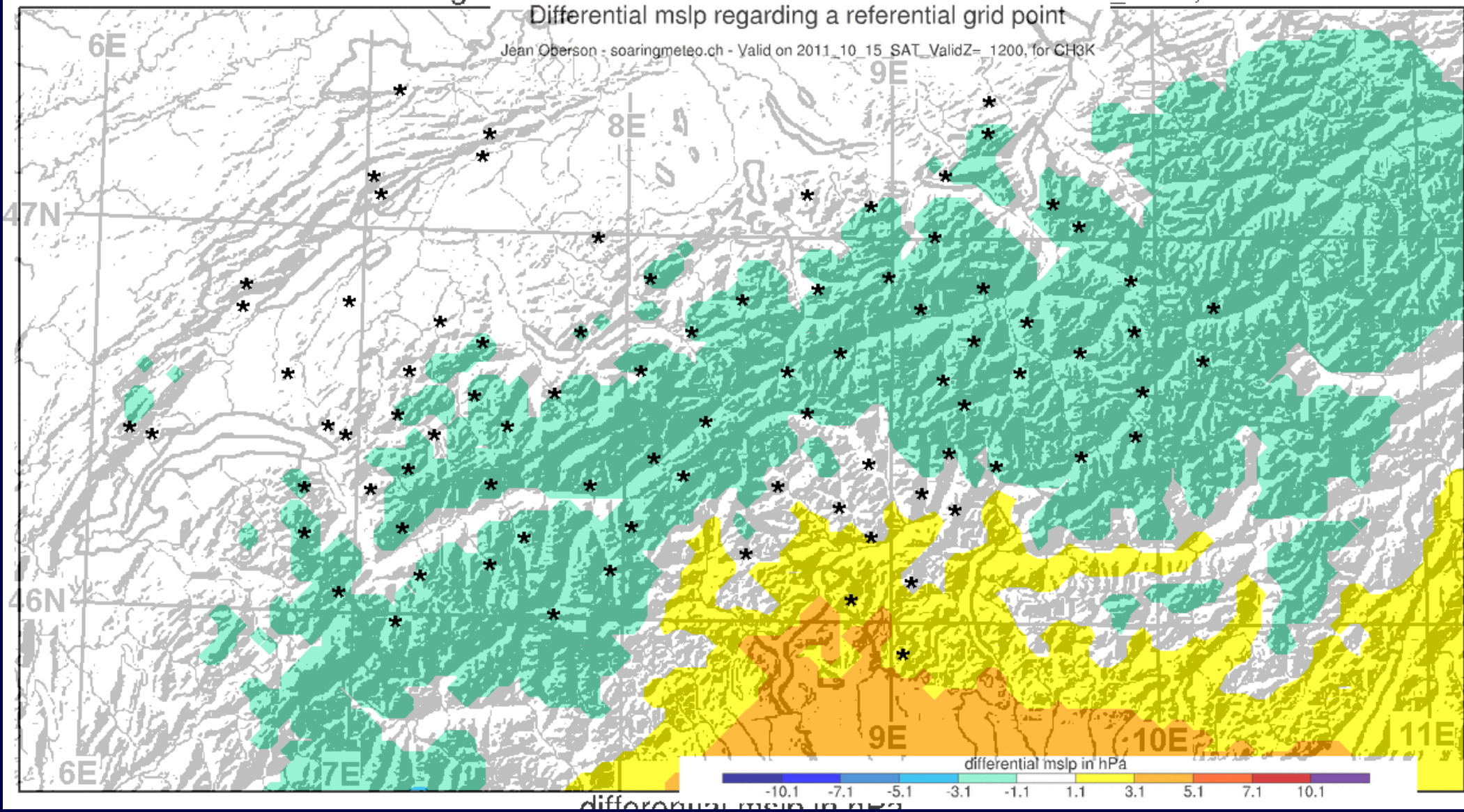
Valid 1200 UTC 12 Oct 2014 (Sat 15 Oct 2014 18h Fcst @ 2254z)  
Djick BLP MAP from NCEP 3.0km GFSN-initiated WRF-ARW model

### Mean Sea Level Pressure



Differential mslp regarding a referential grid point

Jean Oberson - soaringmeteo.ch - Valid on 2011\_10\_15 SAT\_ValidZ= 1200, for CH3K



differential mslp in hPa

differential mslp in hPa

-10.1 -7.1 -5.1 -3.1 -1.1 1.1 3.1 5.1 7.1 10.1

# ThQ = Thermal Quality :

3 paramètres essentiels :

1. Insolation de 0 à 100%

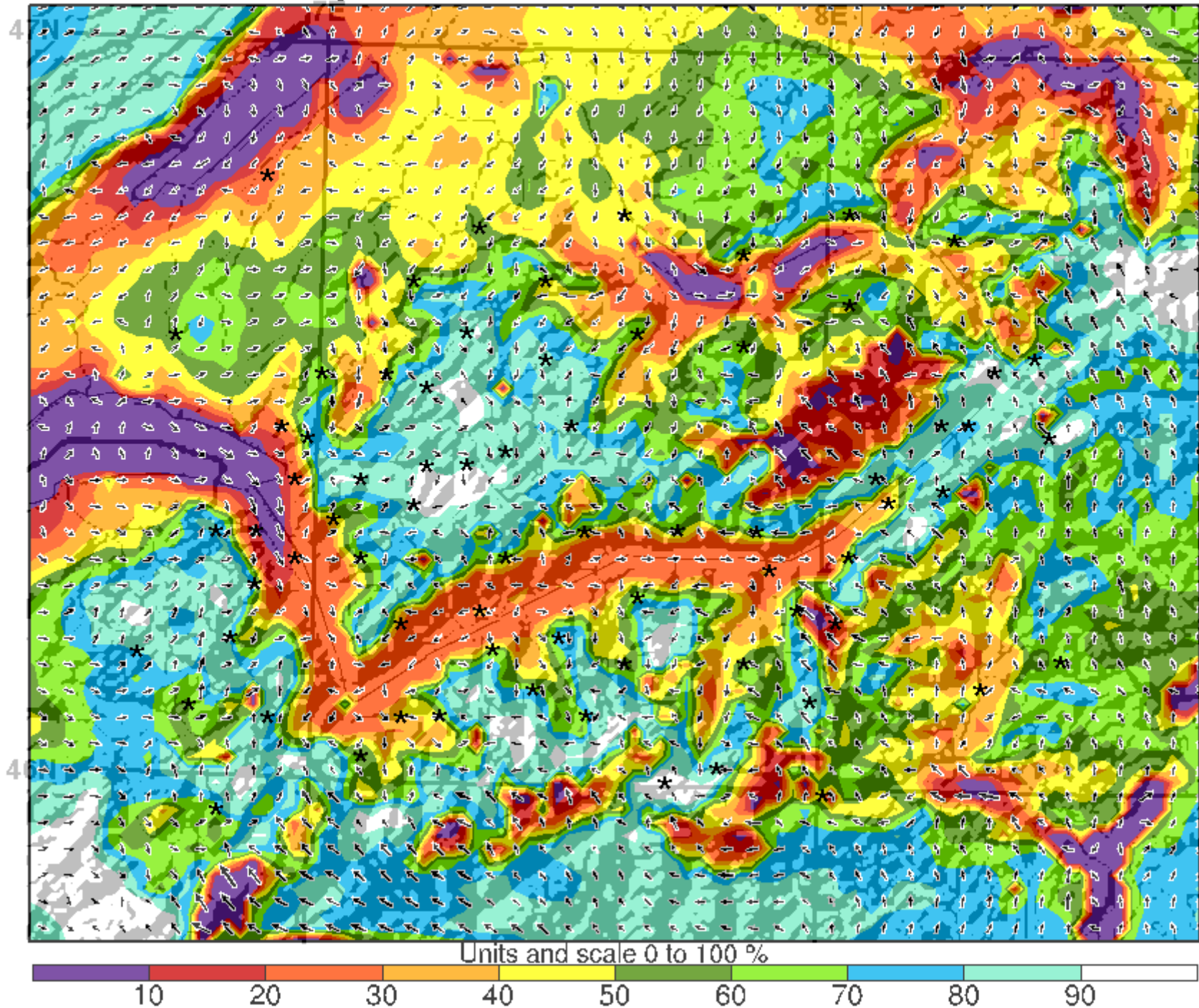
2. BL wind, vents dans la CC, de 0 à > 8 m/s

3. BL depth, épaisseur de la CC, de < 100  
à > 1200 m



# ThQ - global Thermal Quality parameter for paragliding

Jean Oberson - soaringmeteo.ch - Valid on 2011\_9\_29\_THU\_ValidZ=\_1200, for WSA2K



## Bugs de RASP

3 principaux :

- Vent de vallée sous-estimé dans le VS central.
- Problème de la couverture neigeuse vue à macro-échelle à la fin automne, en hiver et au début du printemps.
- Sous-estimation de l'humidité et surestimation de T dans la CC (post pluie et nuits froides et longues).

# BL average wind

Jean Oberson - soaringmeteo.ch - Valid on 2011\_9\_29\_THU\_ValidZ=\_1200, for WSA2K

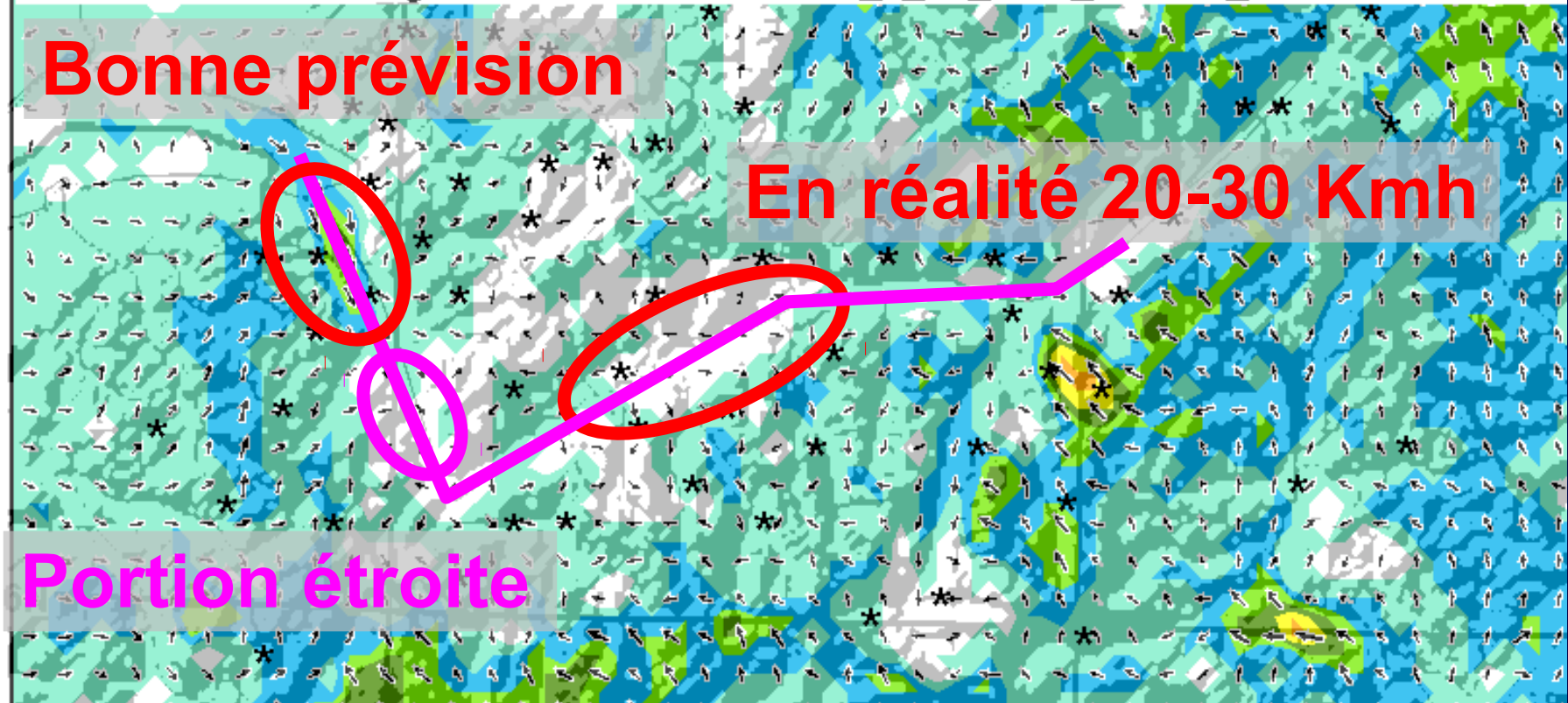
**Bonne prévision**

**En réalité 20-30 Km/h**

**Portion étroite**

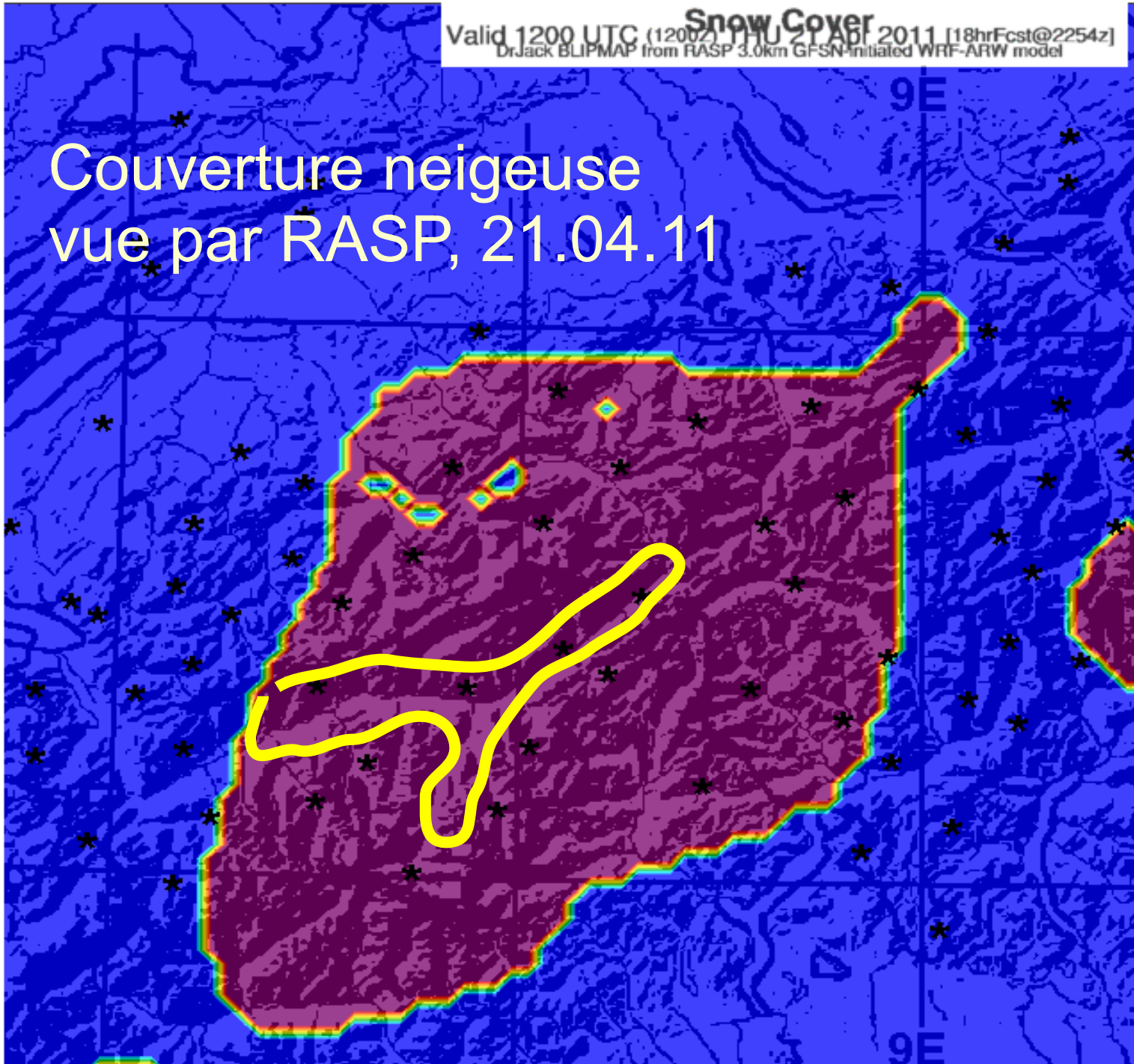
RASP

Réalité



Snow Cover  
Valid 1200 UTC (1200Z) THU 21 APR 2011 [18hrFcst@2254z]  
DrJack BLIPMAP from RASP 3.0km GFSN-initiated WRF-ARW model

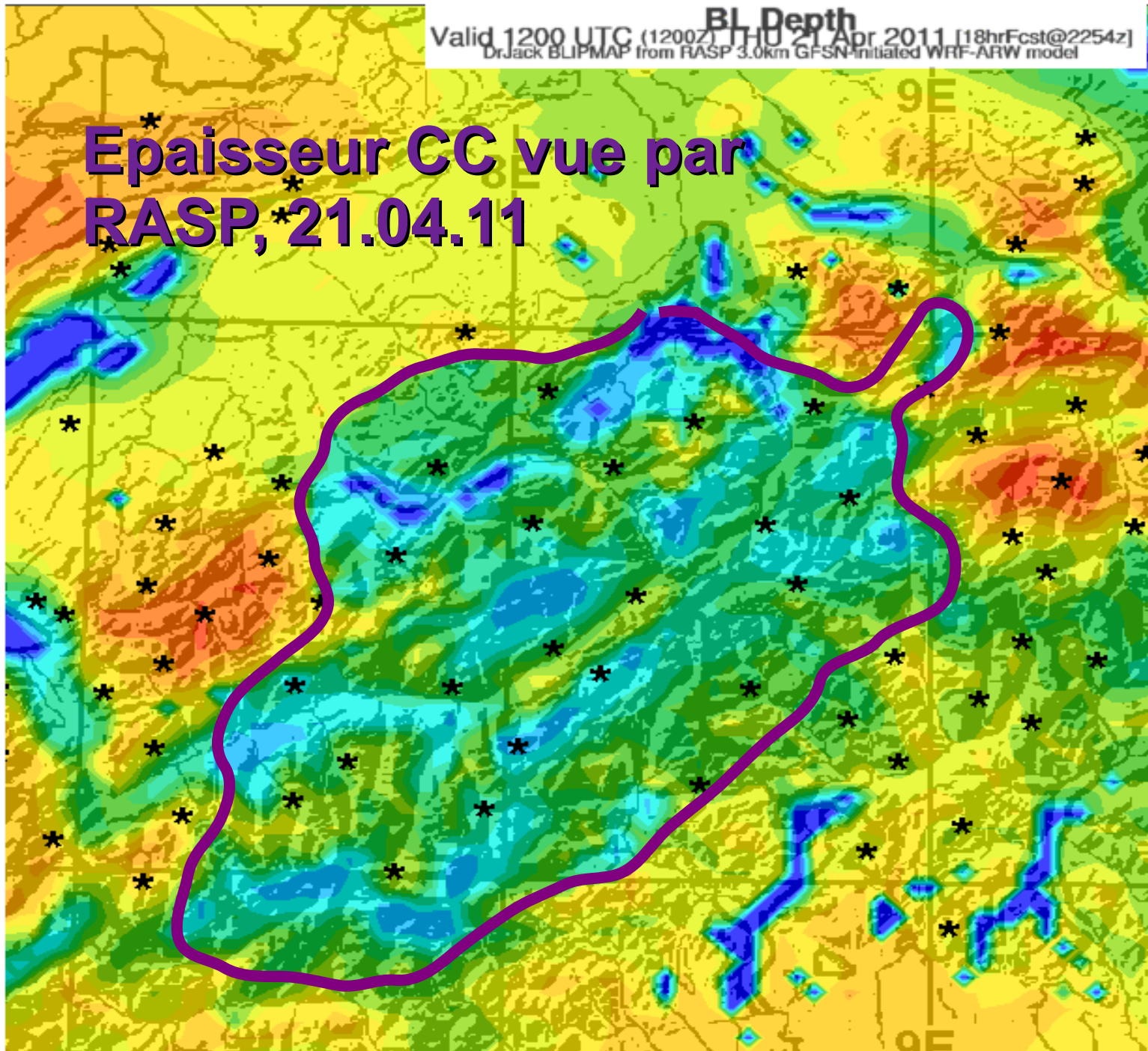
Couverture neigeuse  
vue par RASP, 21.04.11

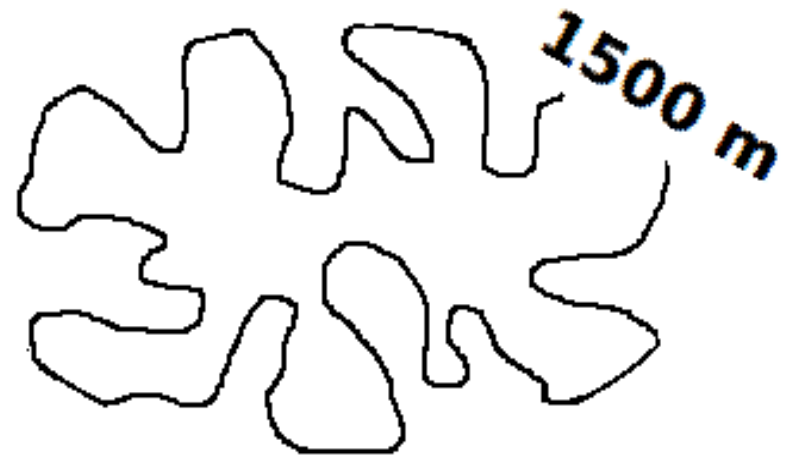
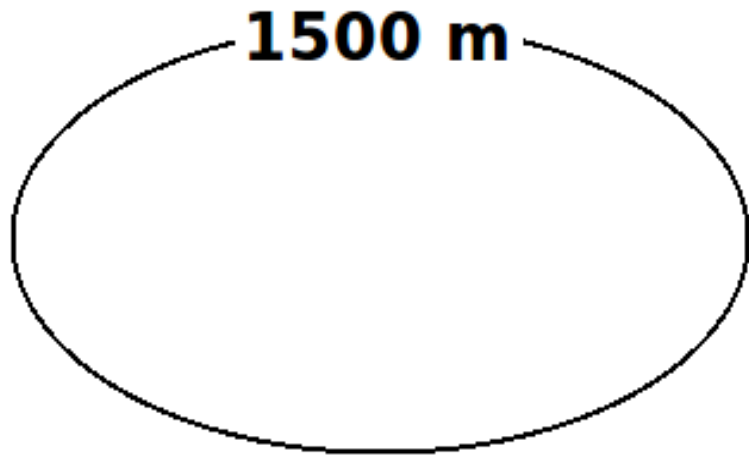




BL Depth  
Valid 1200 UTC (1200Z) THU 21 Apr 2011 [18hrFcst@2254z]  
Dr.Jack BLIPMAP from RASP 3.0km GFSN-initiated WRF-ARW model

# Epaisseur CC vue par RASP, 21.04.11



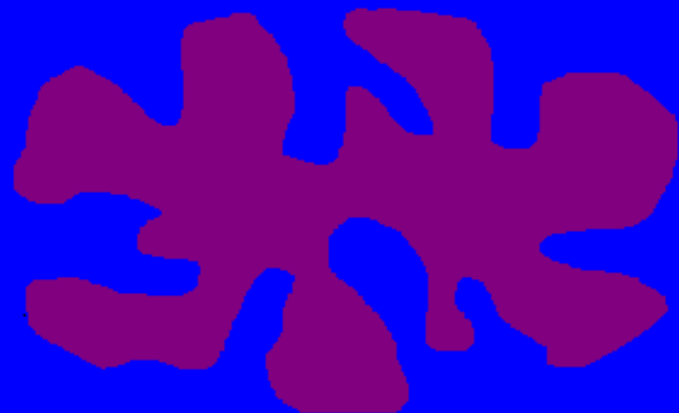
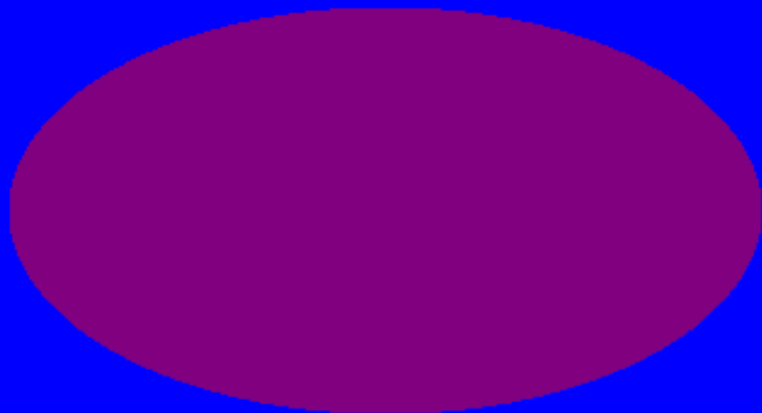


Relief cn 1500 m

macro-échelle

méso-échelle

Neige lim. 1500 m



# Sur et sous estimation T et Td dans la CC :

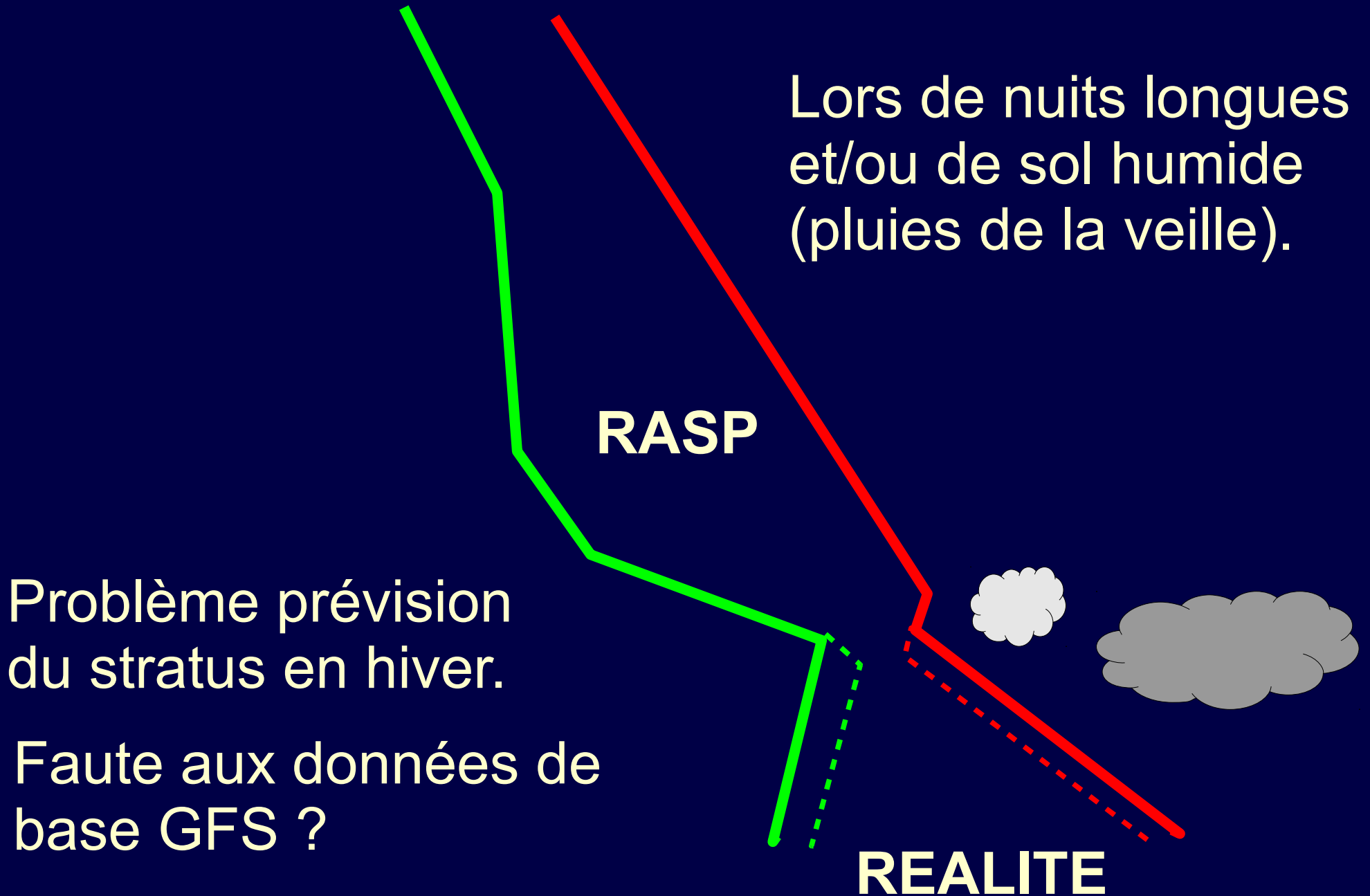
Lors de nuits longues  
et/ou de sol humide  
(pluies de la veille).

**RASP**

Problème prévision  
du stratus en hiver.

Faute aux données de  
base GFS ?

**REALITE**



## Avenir de RASP :

Tout chose a une fin ! RASP dépend de l'humeur du Dr Jack !

Données nécessaires à RASP dépendent d'une certaine stabilité géopolitique.

Si notre société persiste, d'autres modèles à mésoéchelle apparaîtront, probablement meilleurs avec des présentations différentes.

Tout ce que vous avez appris sur la CC et les notions fondamentales restera valable.



**Merci de votre attention !**

**Bonnes fêtes de fin d'année !**