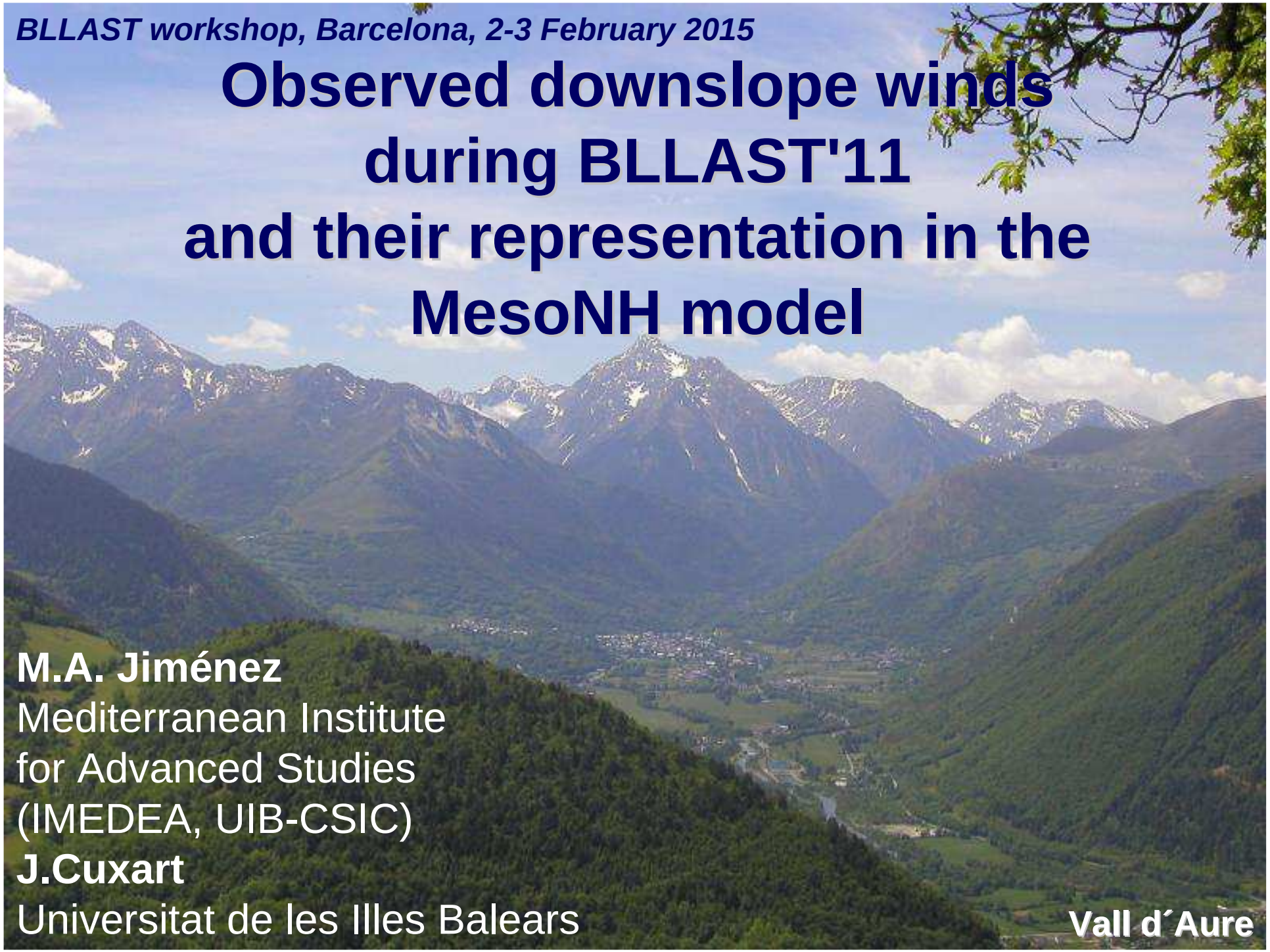


BLLAST workshop, Barcelona, 2-3 February 2015

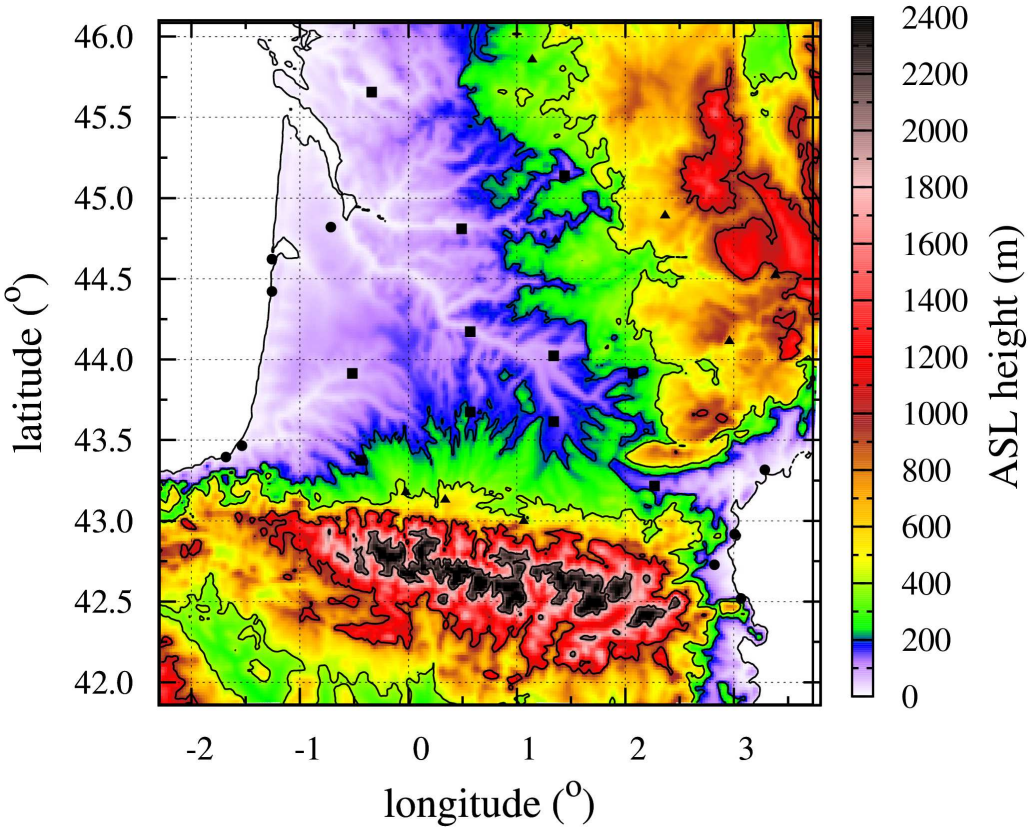
Observed downslope winds during BLLAST'11 and their representation in the MesoNH model

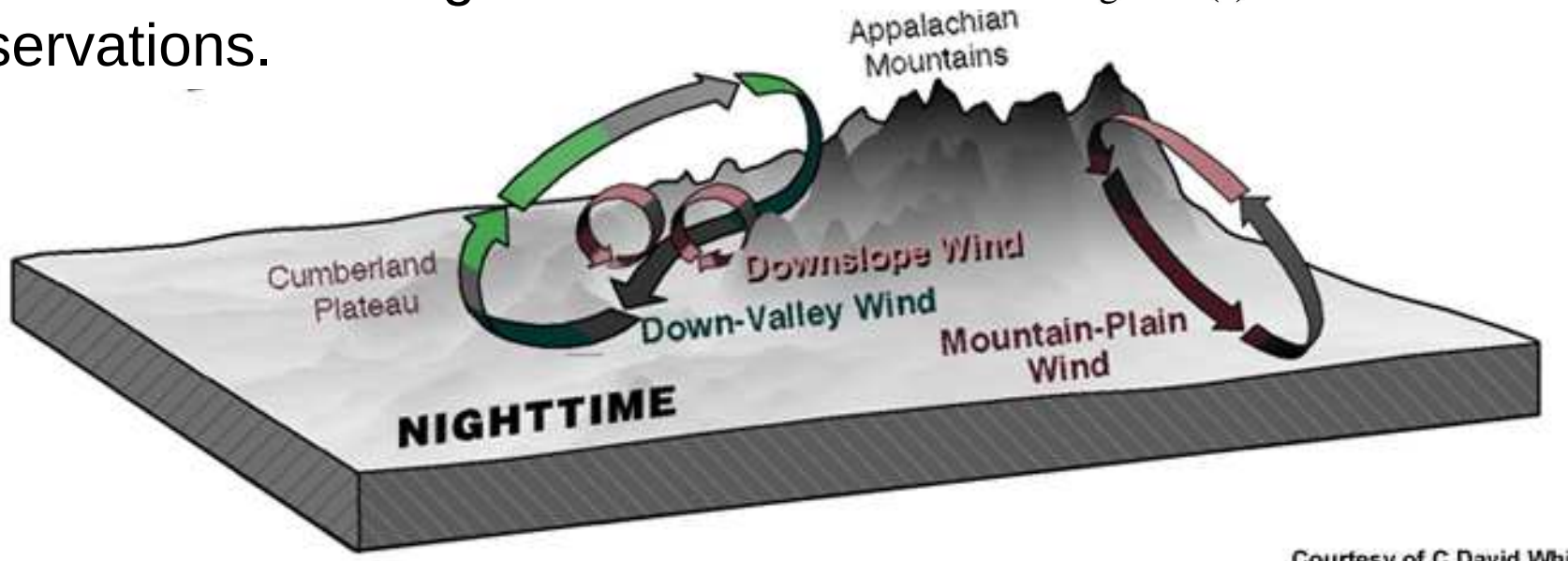
M.A. Jiménez
Mediterranean Institute for Advanced Studies (IMEDEA, UIB-CSIC)
J.Cuxart
Universitat de les Illes Balears

Vall d´Aure

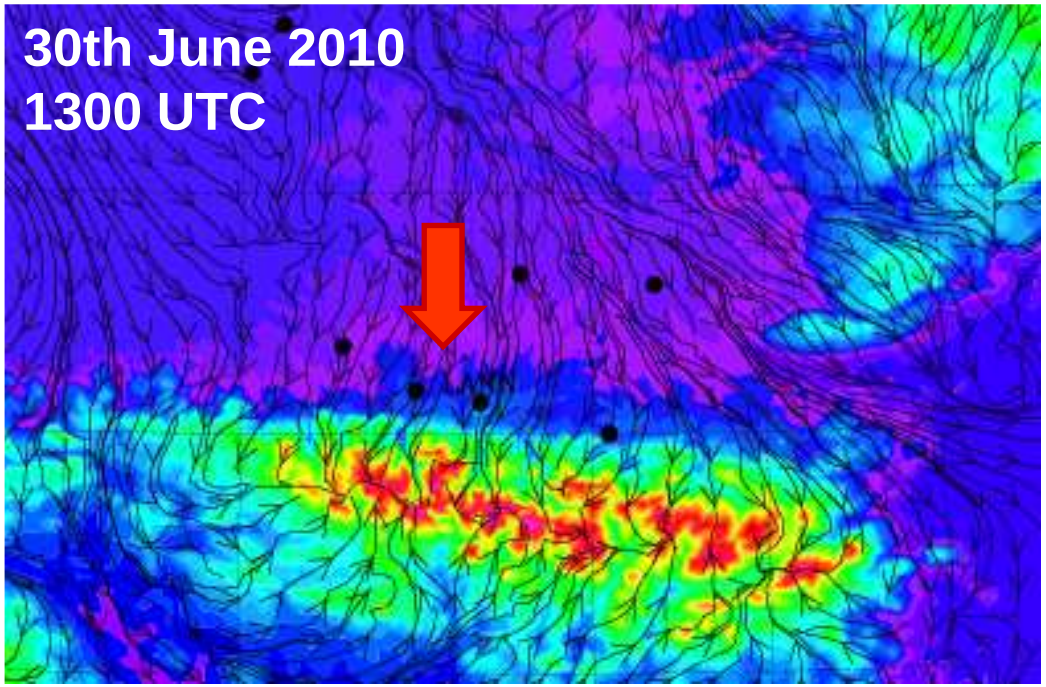
OBJECTIVE

To study the **downslope/down-valley** winds generated at the **slope/valleys** in the north side of the Pyrenees that reach **Lannemezan** during BLLAST'11 through HR mesoscale modelling and observations.





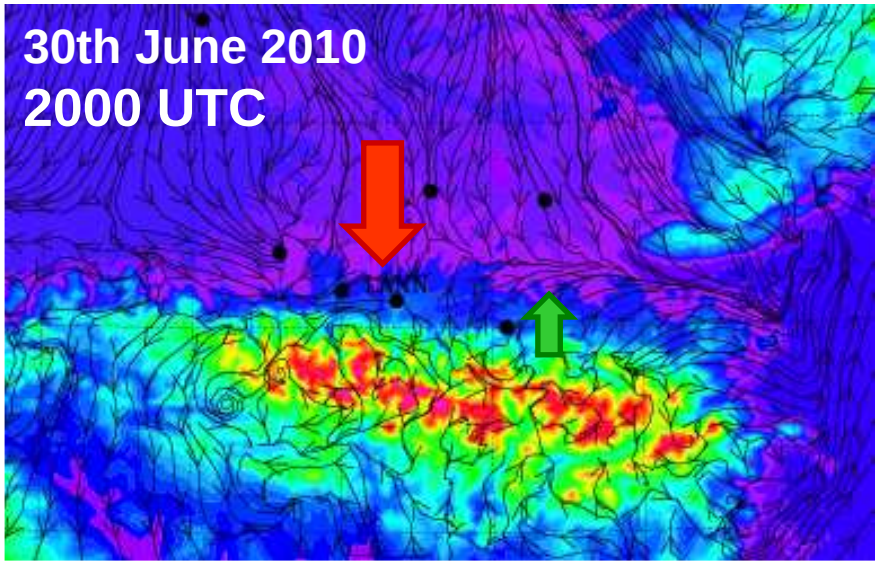
Courtesy of C.David Whiteman

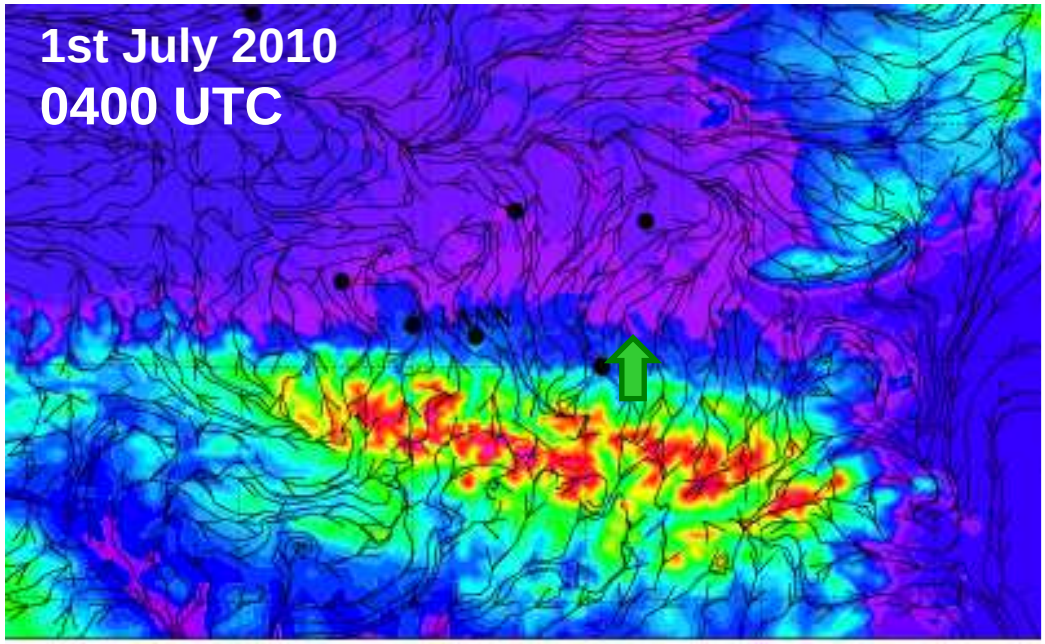


PREVIOUS WORK (*PRE-BLLAST*)

streamlines at 50 m (a.g.l.)

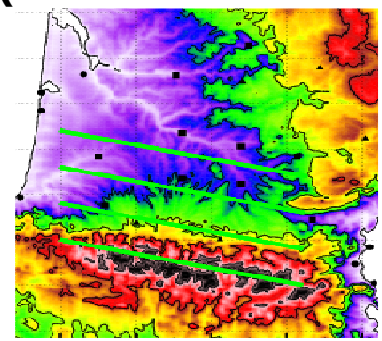
Day: upslope winds
Night: downslope winds

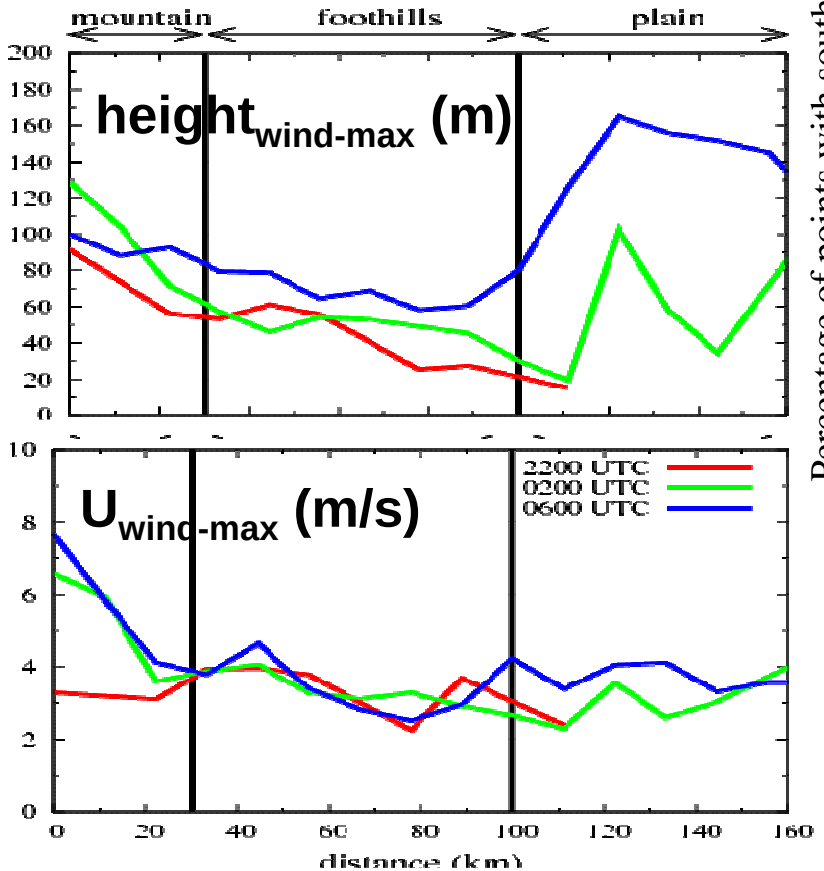


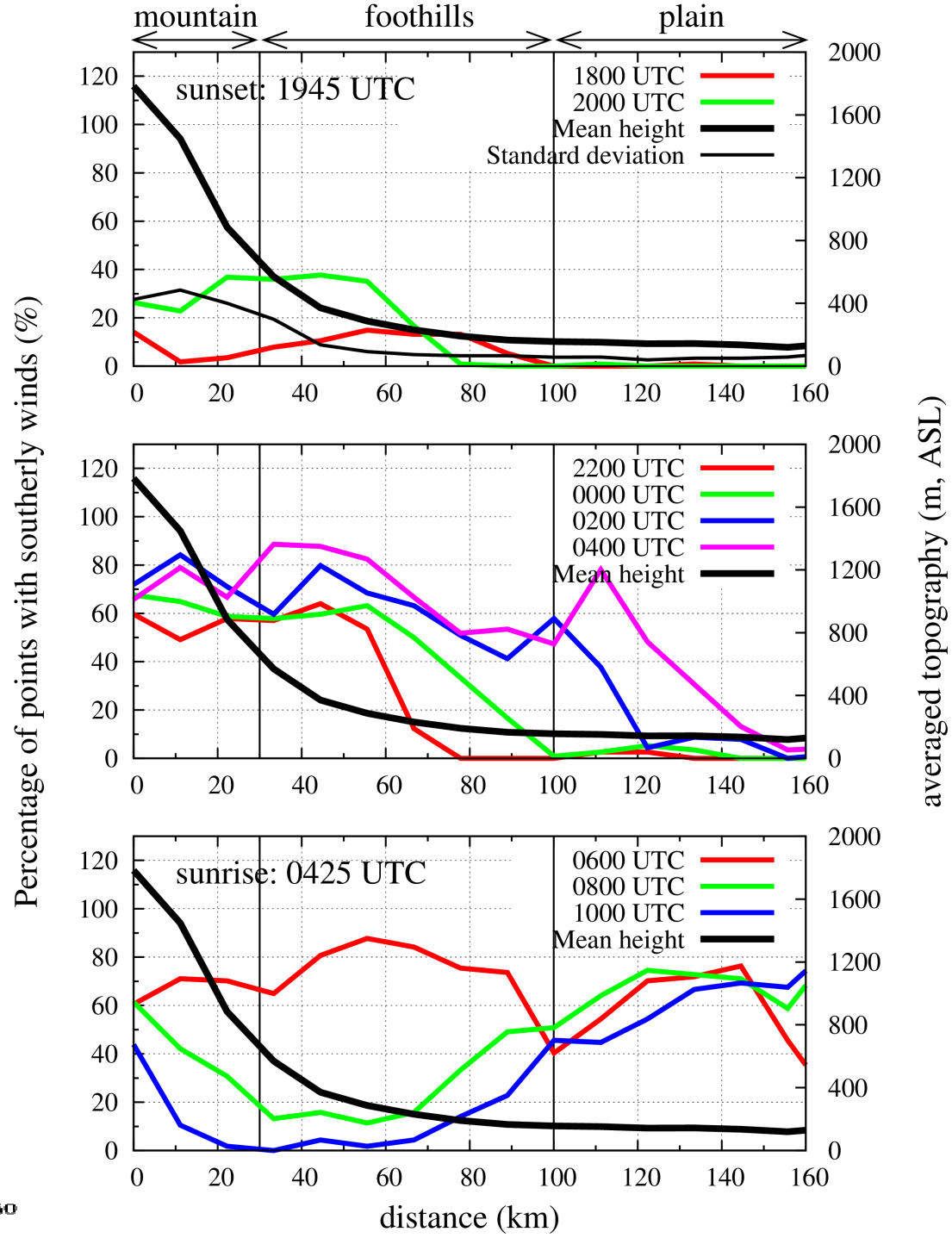


Analysis of the downslope winds

(Jiménez and Cuxart, 2014, AR)







TOOLS

✓**observations: soundings, AWS, UHF, ...**

✓**HR mesoscale modelling**

MESONH model

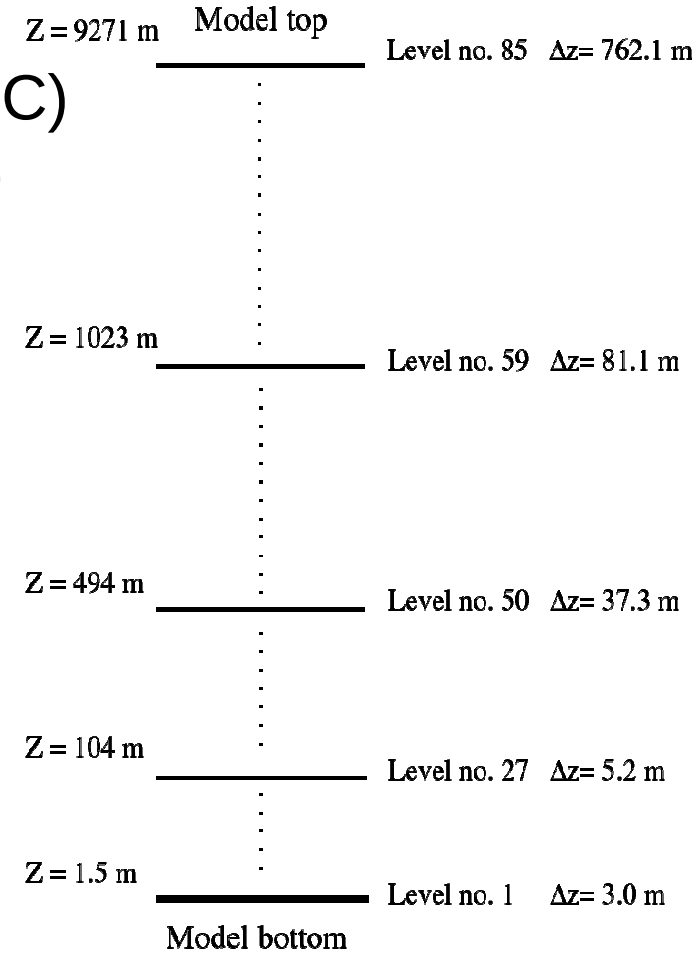
analysis ECMWF (initial and lateral BC)

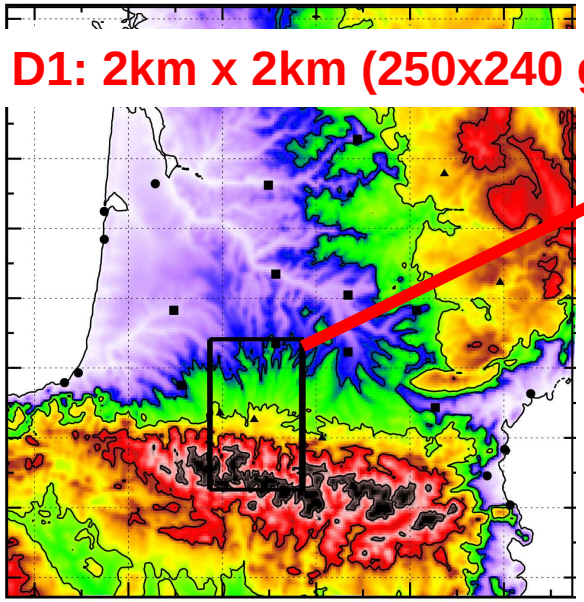
3 nested domains (2km, 400m, 80m)

runs at **ECMWF supercomputer**

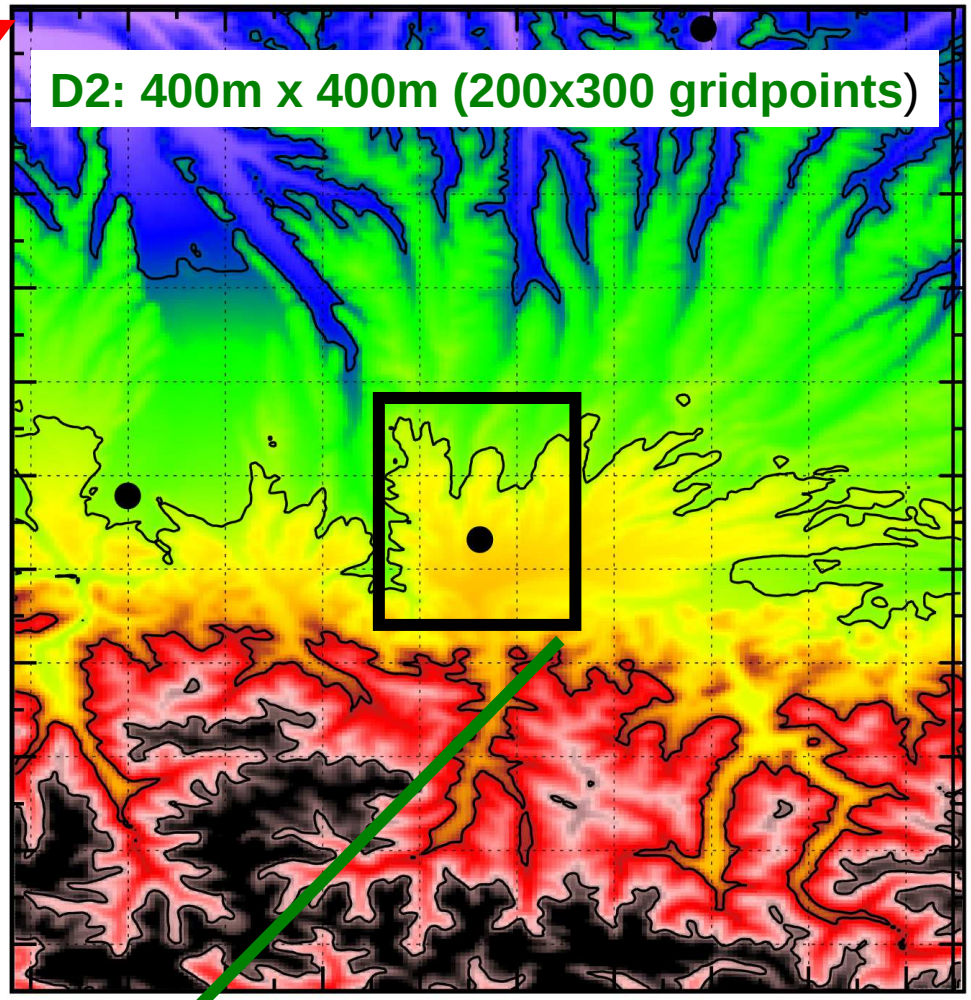
fine resolution at lower levels

Jiménez and Cuxart (2014, AR)

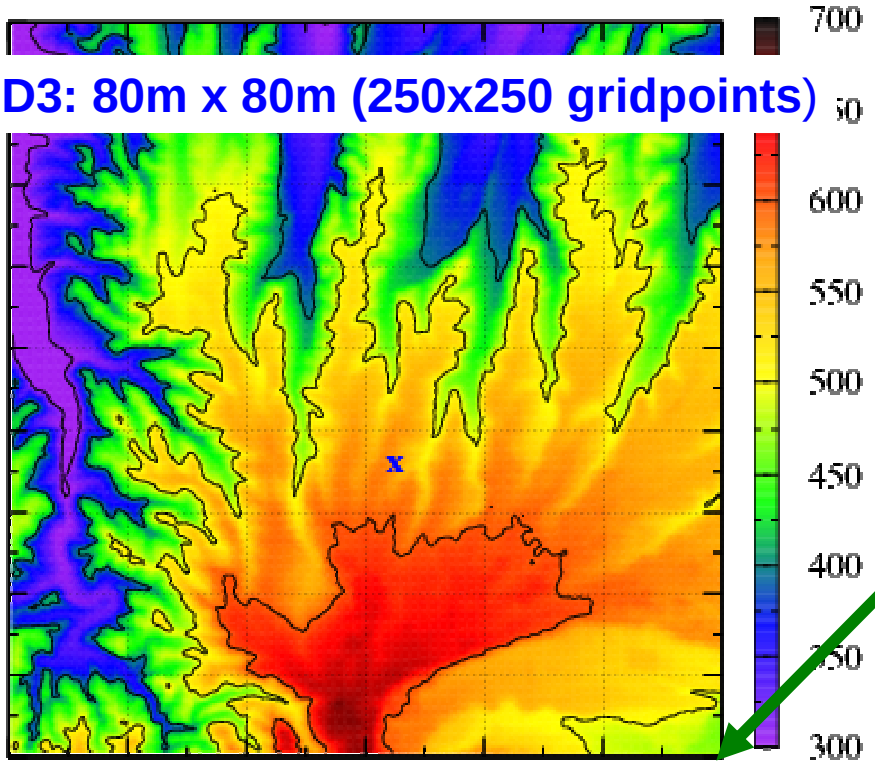




D1: 2km x 2km (250x240 gridpoints)



D2: 400m x 400m (200x300 gridpoints)



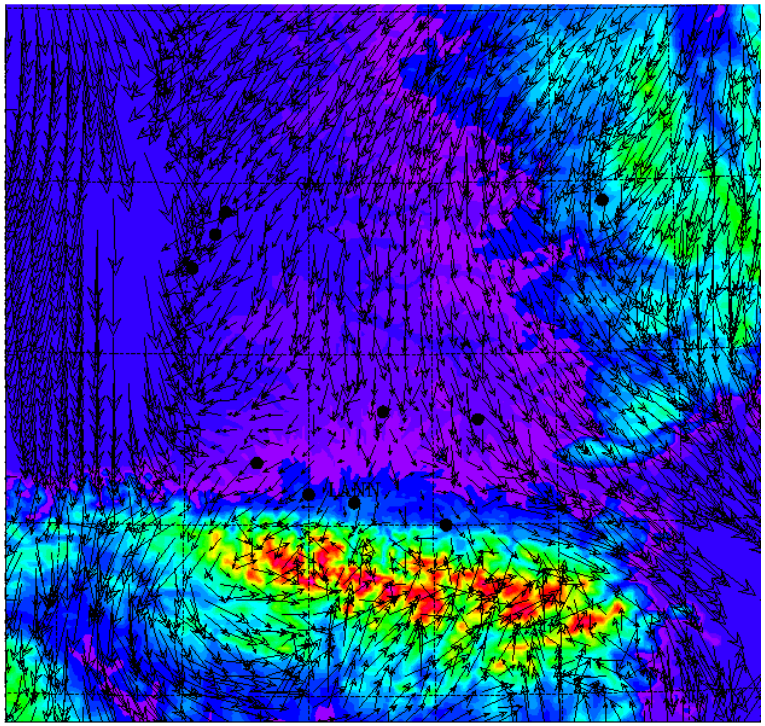
D3: 80m x 80m (250x250 gridpoints)

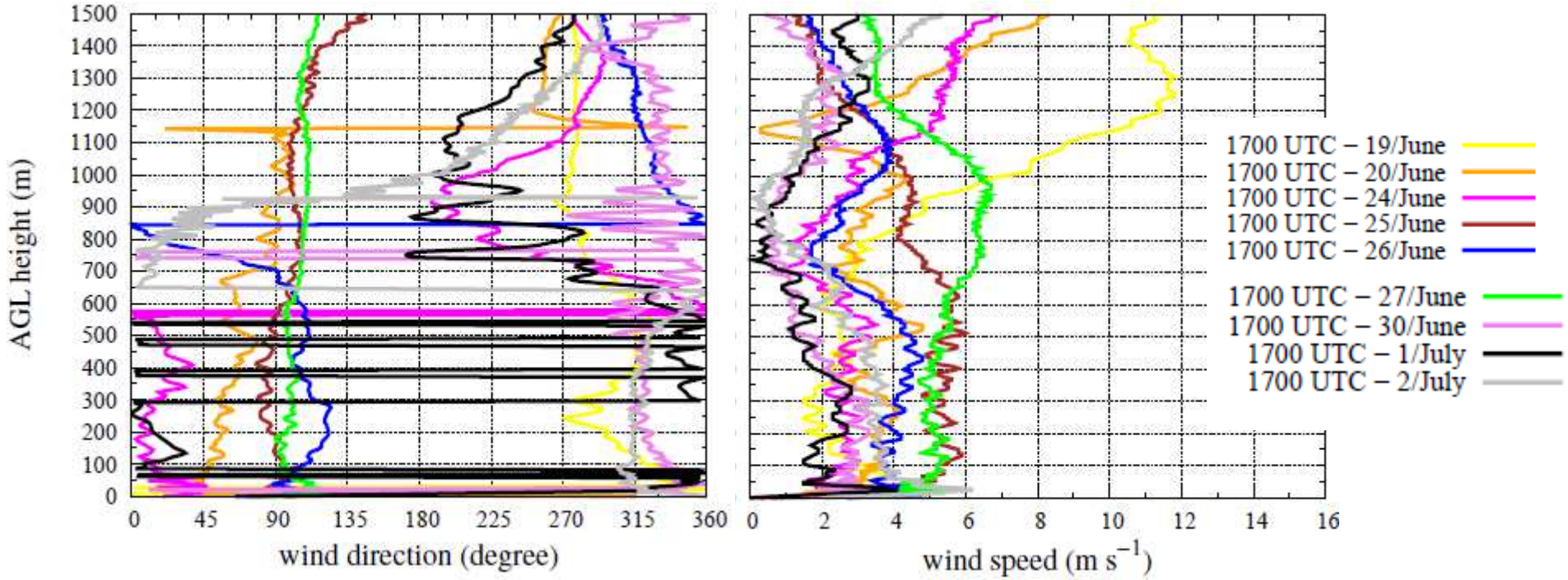
D1: 29 June at 0000 UTC
3 July at 0000 UTC

D2: 1 July at 1800 UTC
2 July 1000 UTC

D3: 1 July at 2300 UTC
2 July at 1000 UTC

1700 UTC

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wind direction (degree)
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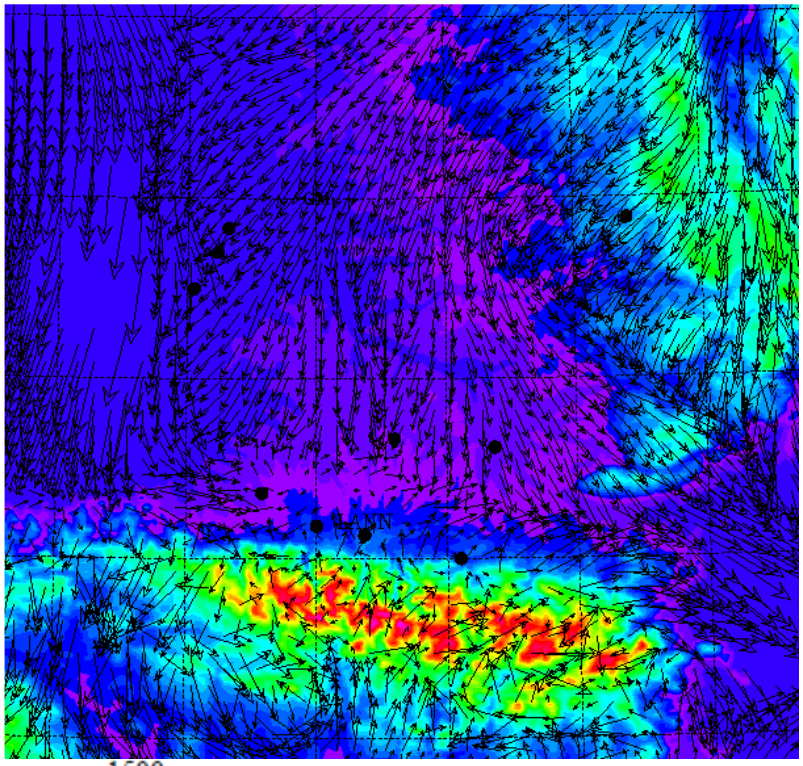
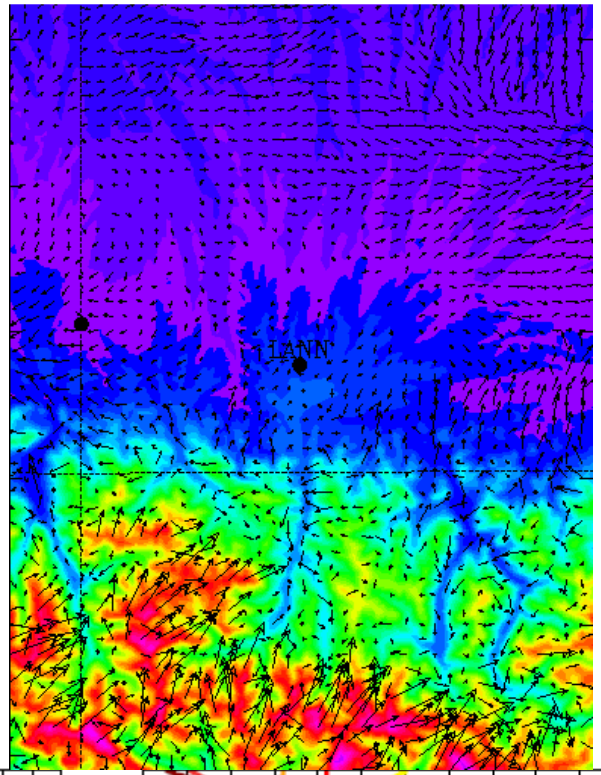
wind speed (m s^{-1})
1700 UTC – 19/June
1700 UTC – 20/June
1700 UTC – 24/June
1700 UTC – 25/June
1700 UTC – 26/June
1700 UTC – 27/June
1700 UTC – 30/June
1700 UTC – 1/July
1700 UTC – 2/July

2000 UTC


LANN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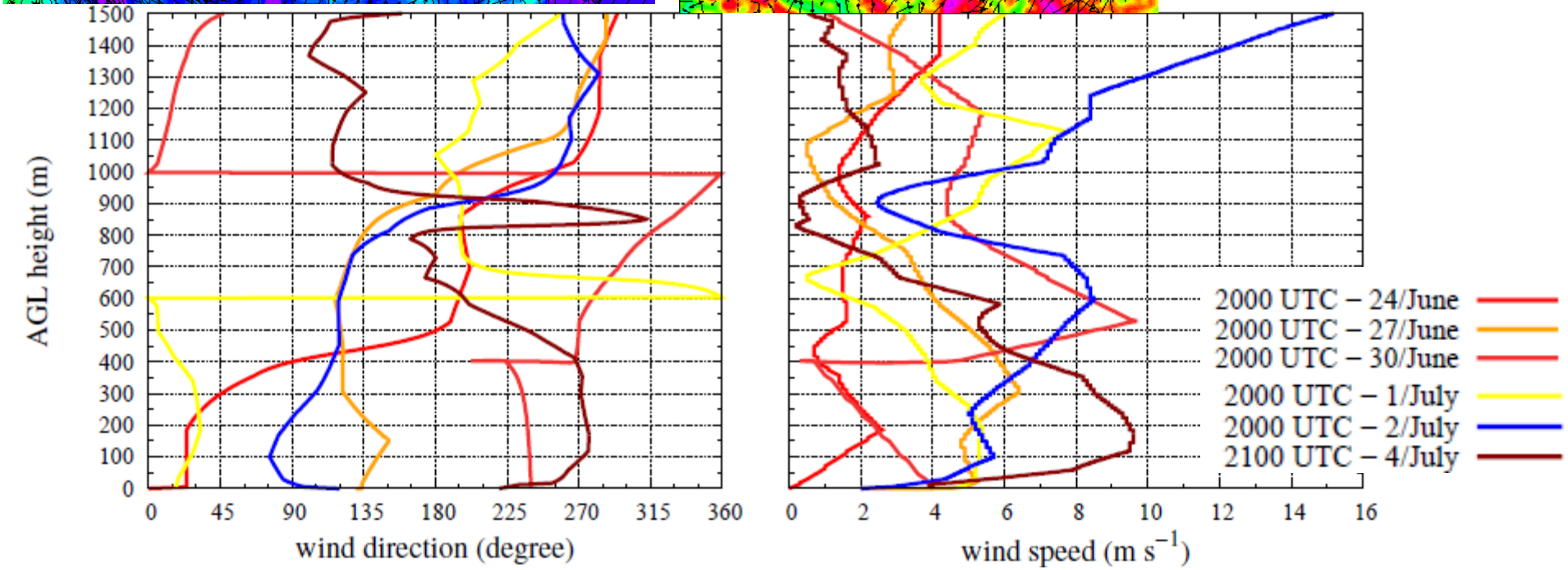
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wind speed (m s^{-1})
2000 UTC – 24/June
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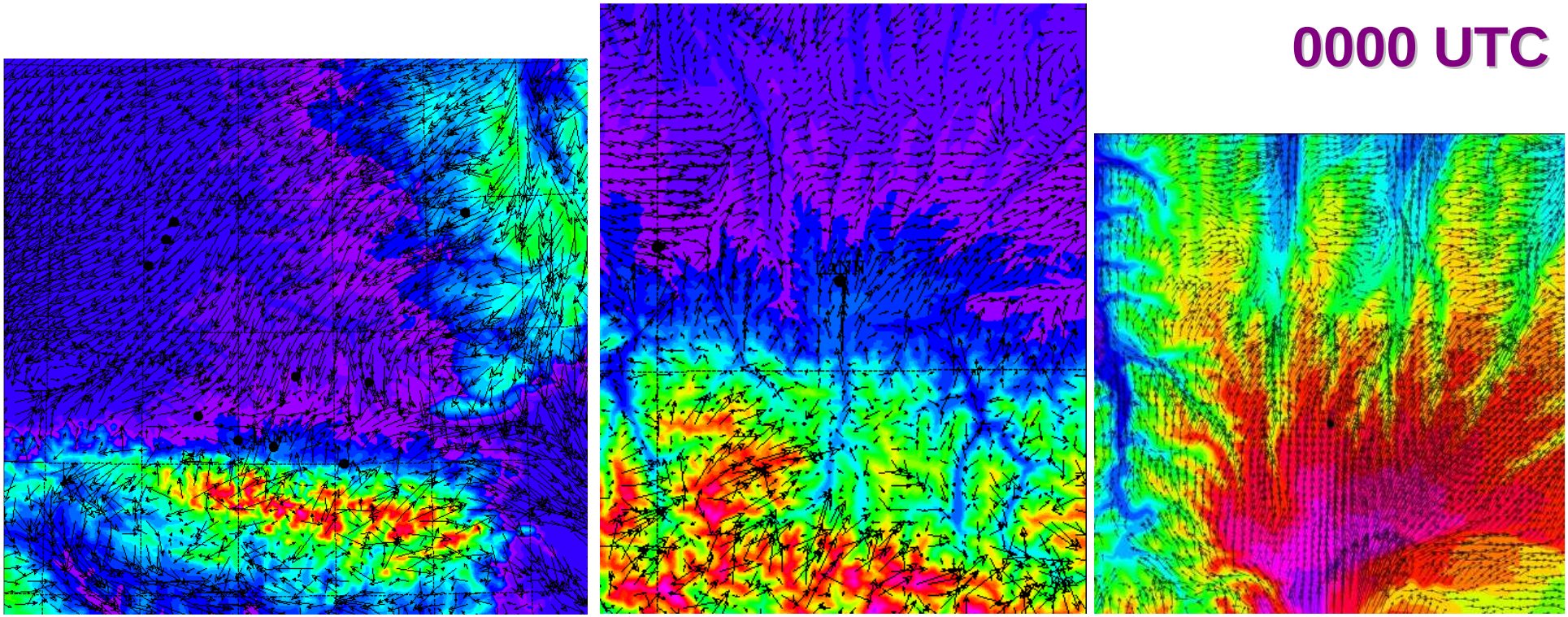
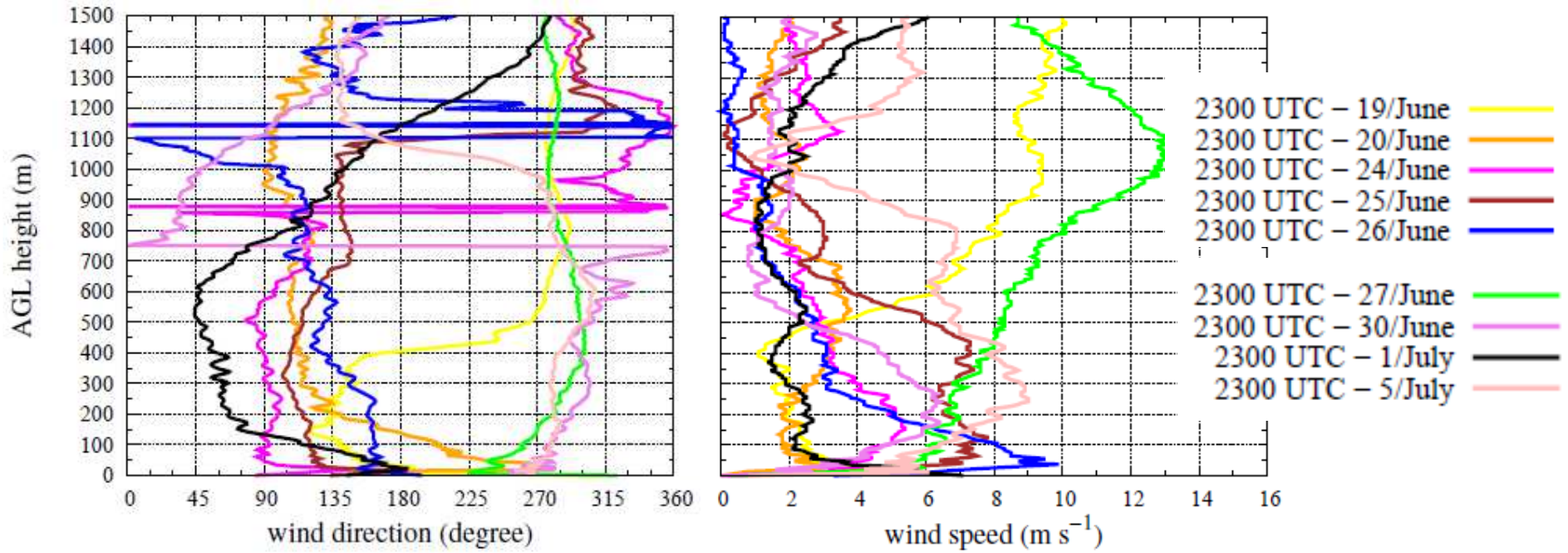
2000 UTC – 30/June
2000 UTC – 1/July
2000 UTC – 2/July
2100 UTC – 4/July

0000 UTC

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wind speed (m s^{-1})
2300 UTC – 19/June
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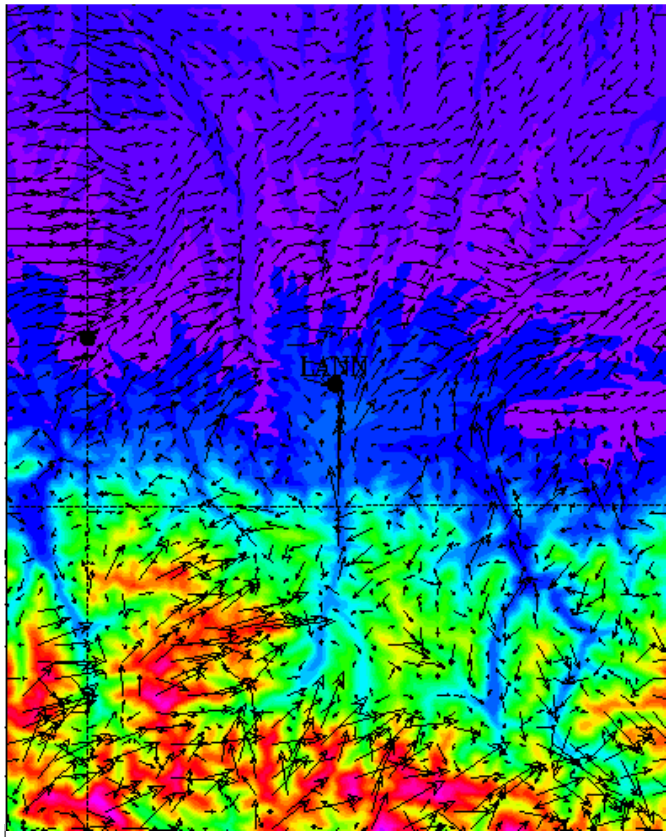
2300 UTC – 30/June
2300 UTC – 1/July
2300 UTC – 5/July

0200 UTC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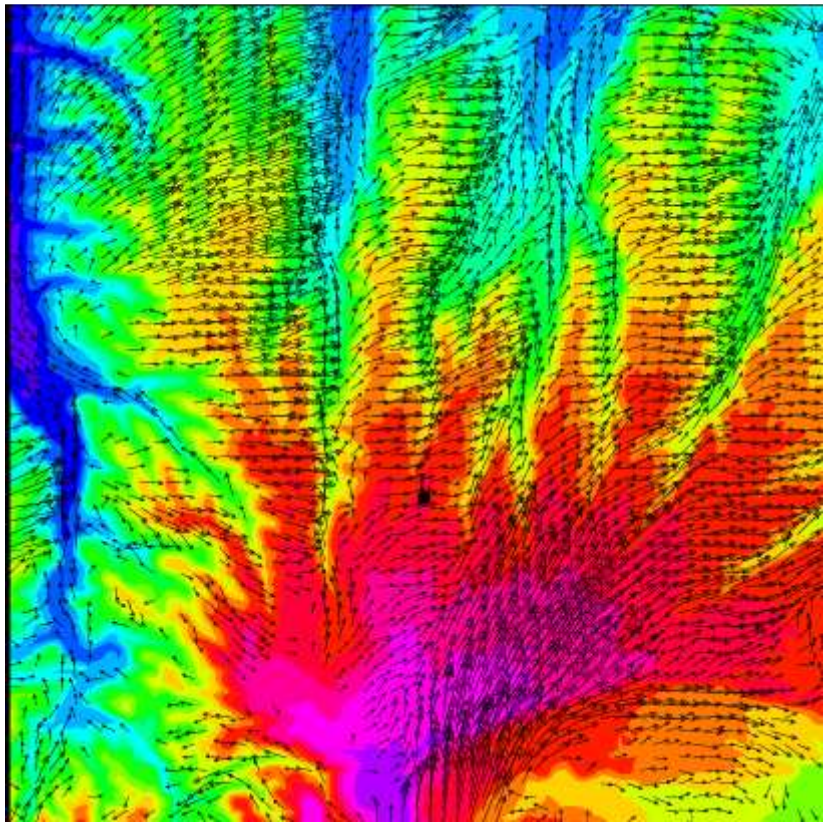

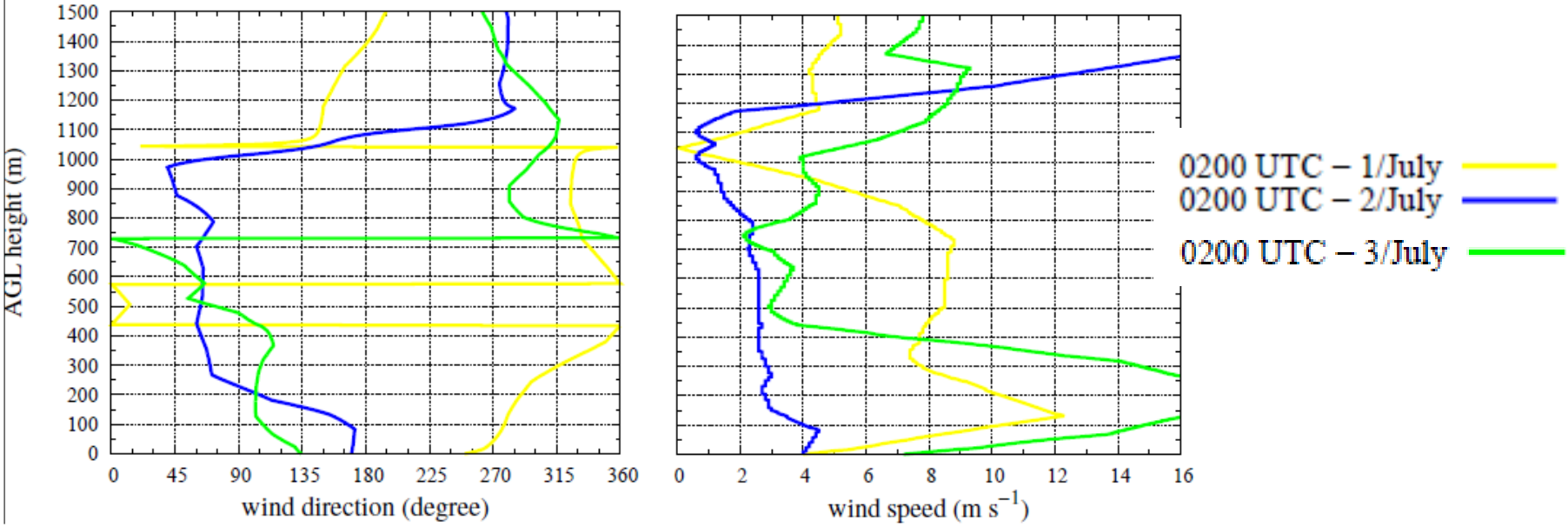
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wind direction (degree)
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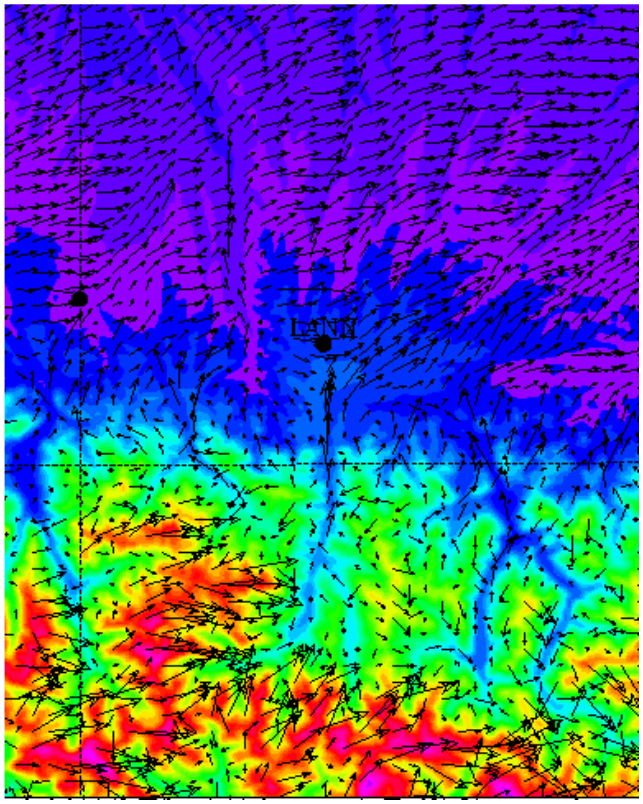
wind speed (m s^{-1})
0200 UTC – 1/July
0200 UTC – 2/July
0200 UTC – 3/July

0500 UTC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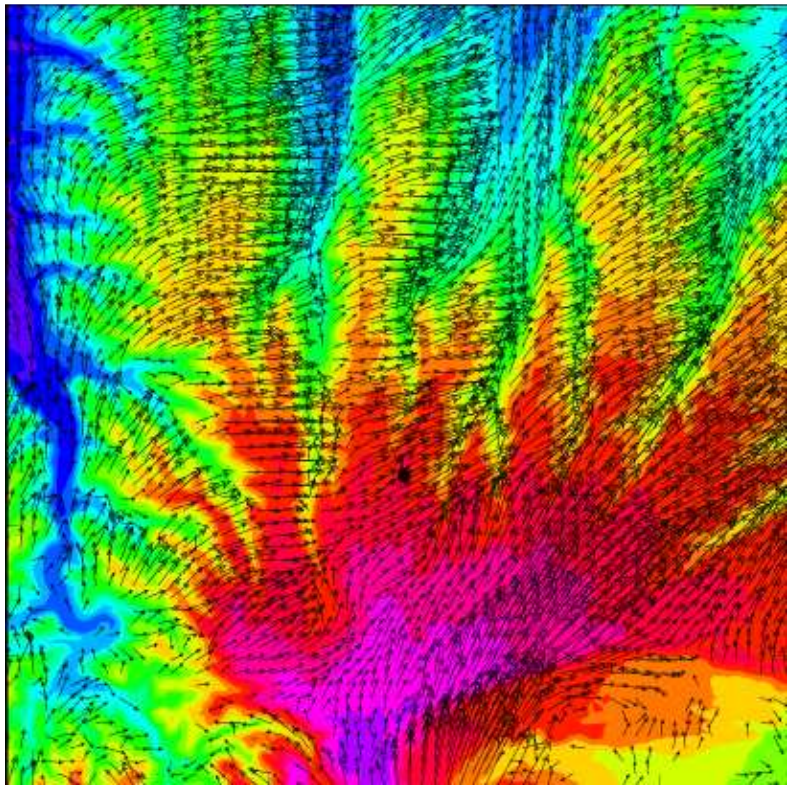

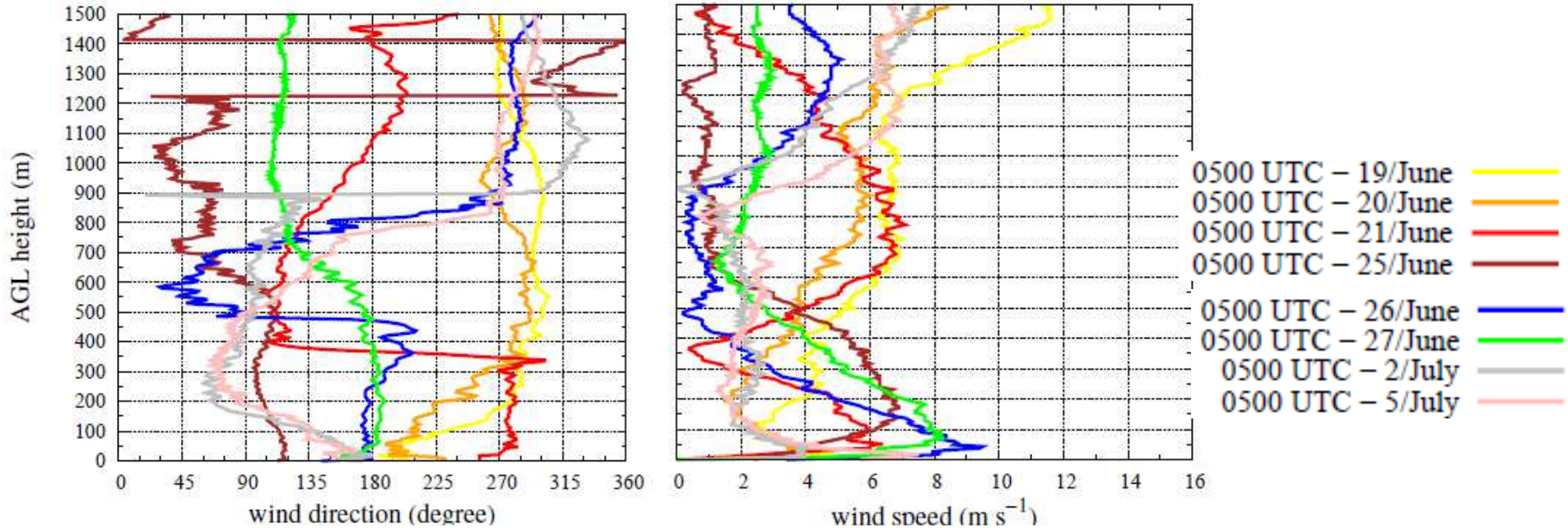
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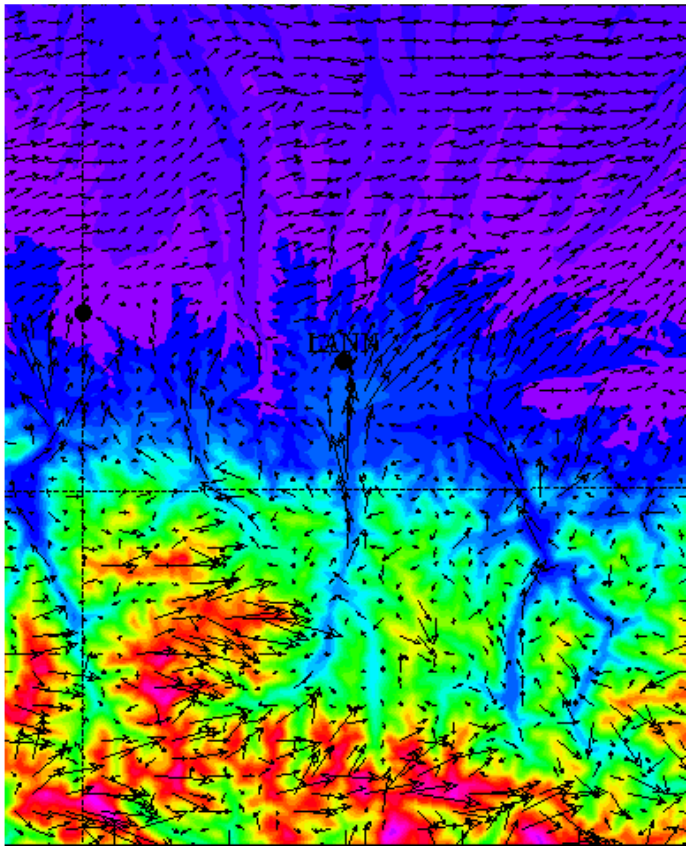
0500 UTC – 5/July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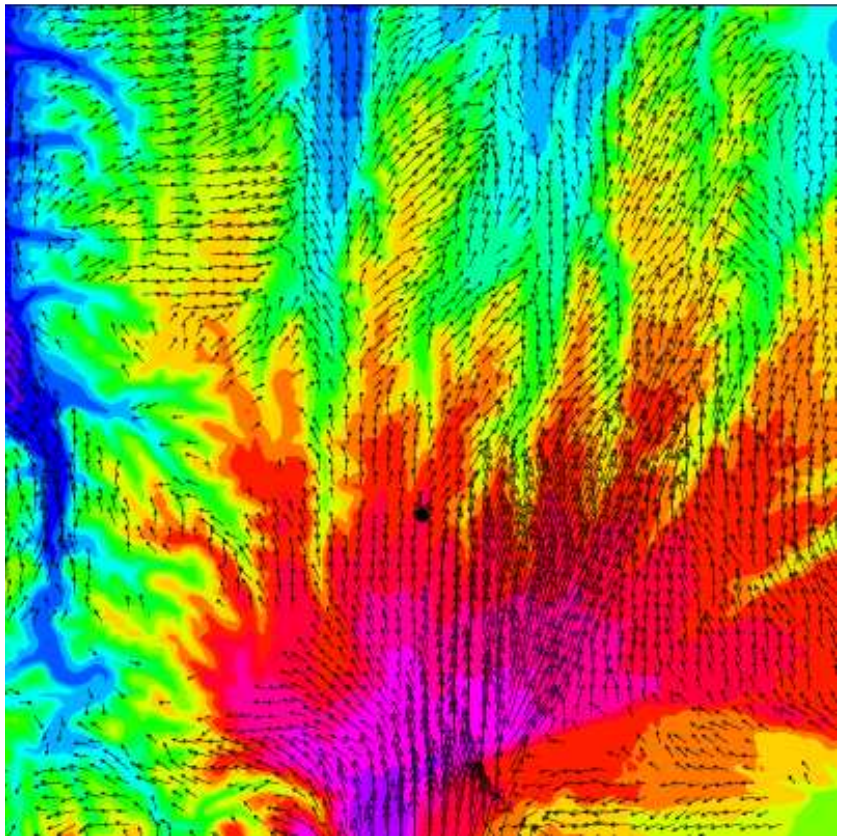

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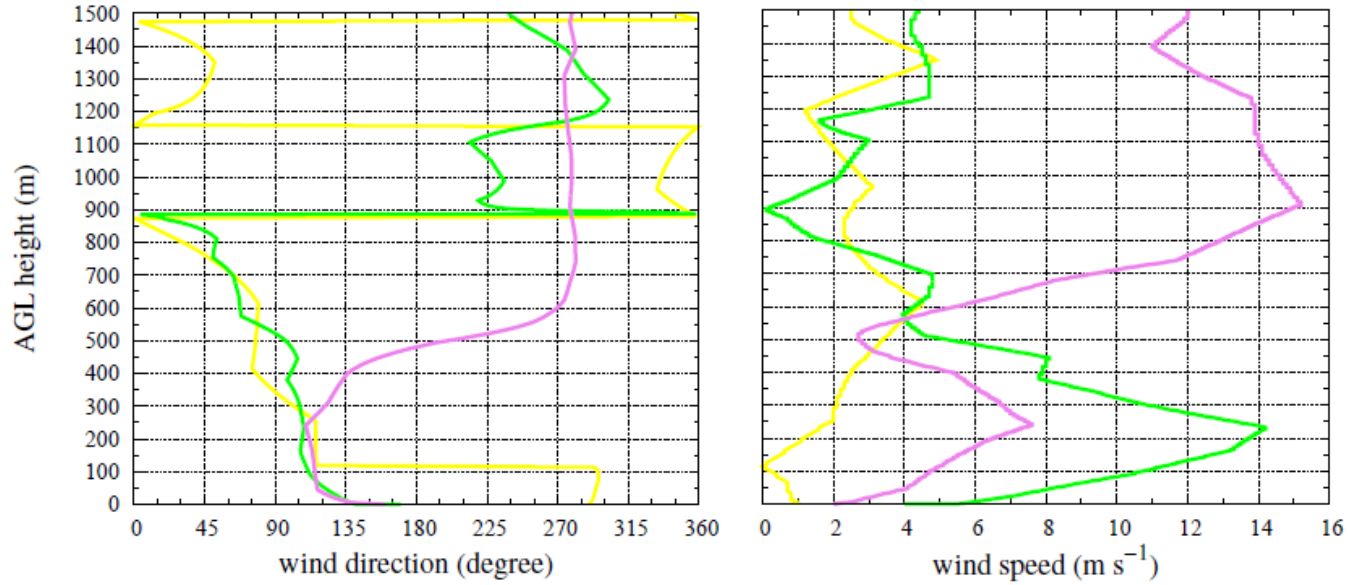
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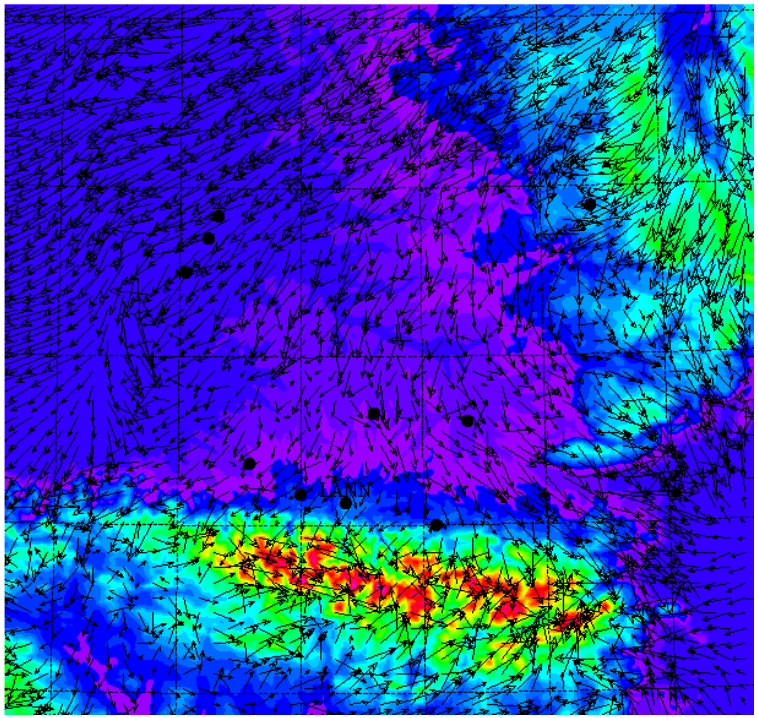
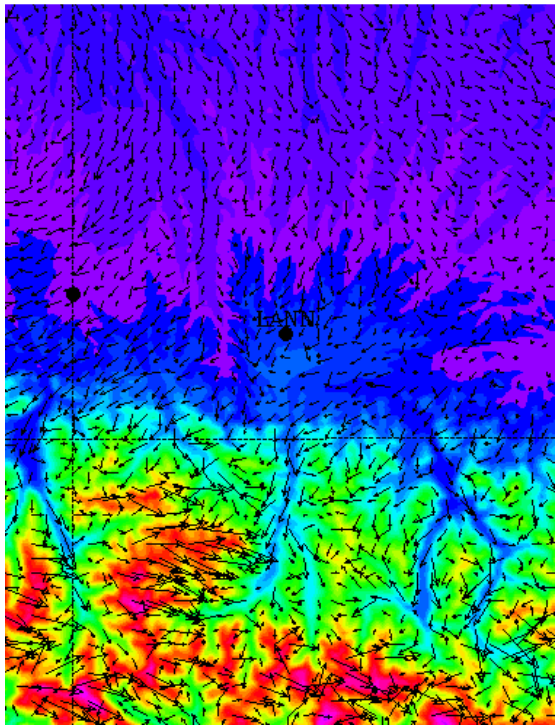
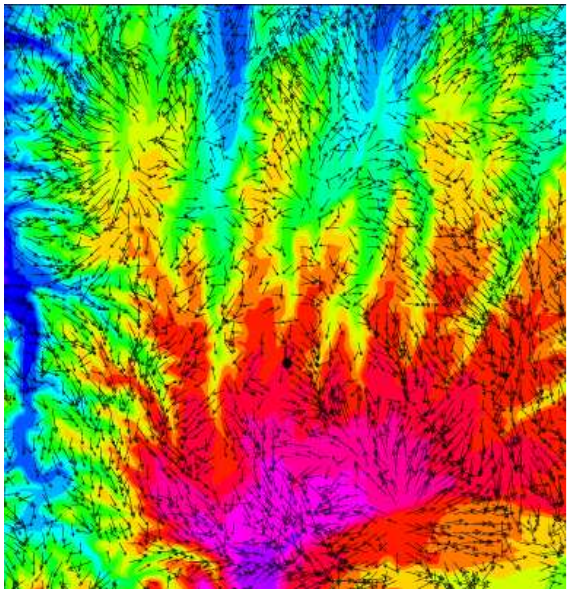
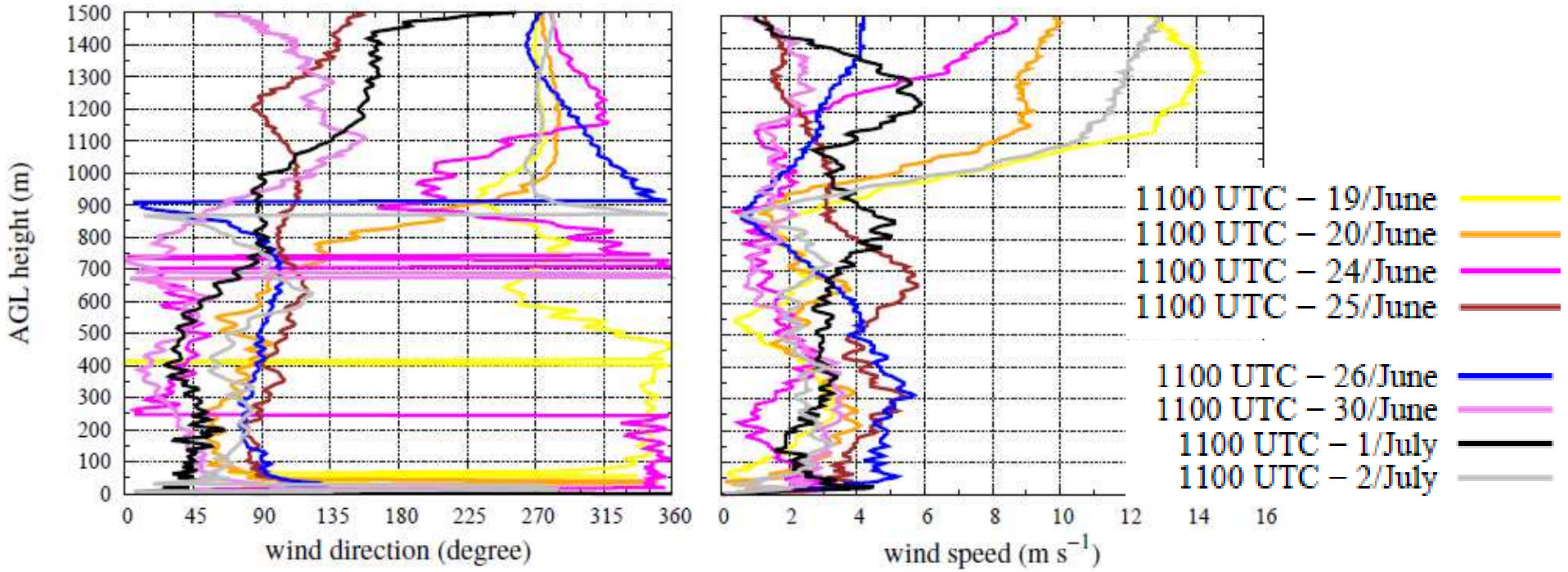
0730 UTC – 1/July
0500 UTC – 3/July
0730 UTC – 5/July

1100 UTC





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1100 UTC – 19/June
1100 UTC – 20/June
1100 UTC – 24/June
1100 UTC – 25/June
1100 UTC – 26/June
1100 UTC – 30/June
1100 UTC – 1/July
1100 UTC – 2/July

SUMMARY

WIND MAXIMUM	LOW (50m)	HIGH (200m)
WEAK (5m/s)	19-20 June (S) **1-2 July (S-SE)**	
MODERATE (9m/s)	25-26 June (S) 26-27 June (S)	4-5 July (W-SW)
STRONG (16m/s)		2-3 July (E-SE)

Down-valley winds (Aure Valley)

Mountain plain winds
Neighbour down-valley winds

Maximum winds at heights higher than 200m (i.e. 600m) are related to larger-scale (basin or meso scales)