# Simulations in the Jordan Narrows

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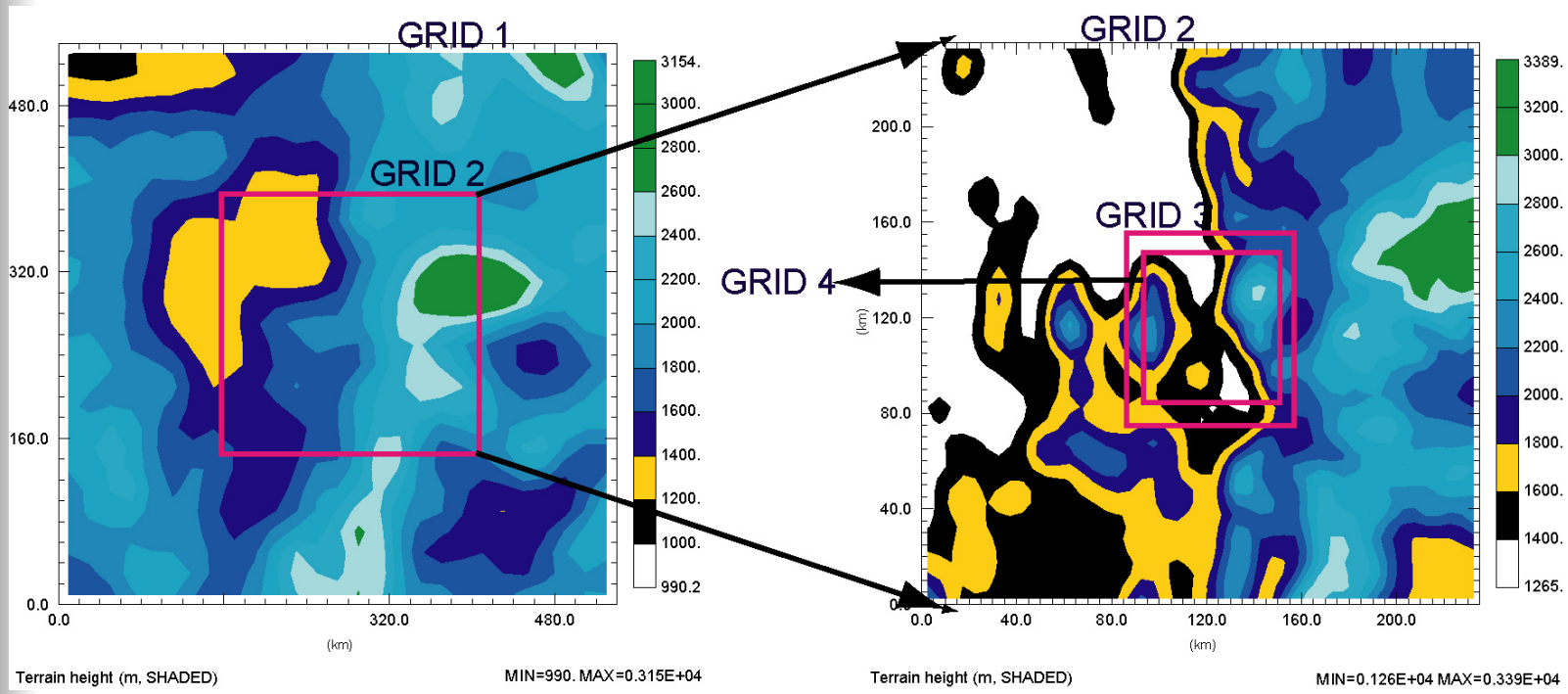
# Model and Methods

**Model:** ARPS (Advanced Regional Prediction System)

**Methods:** NCEP Eta 40 km ⇒ ARPS 20 km ⇒ ARPS 5 km ⇒ ARPS 1 km ⇒ ARPS 250 m




The computational grids in ARPS model

# Model and Methods

| Parameter | grid1 | grid2 | grid3 | grid4 |
|---|---|---|---|---|
| Domain size | 600km | 250km | 80km | 60km |
| Horizontal grid spacing: | 20km | 5km | 1km | 250m |
| Vertical spacing $dz_{min}$ | 400m | 400m | 50m | 50m |
| The number of layers in the lowest 1km above surface | 2 | 2 | 16 | 16 |
| Model top | 20km | 20km | 20km | 20km |

The model parameter settings

# Simulation Periods

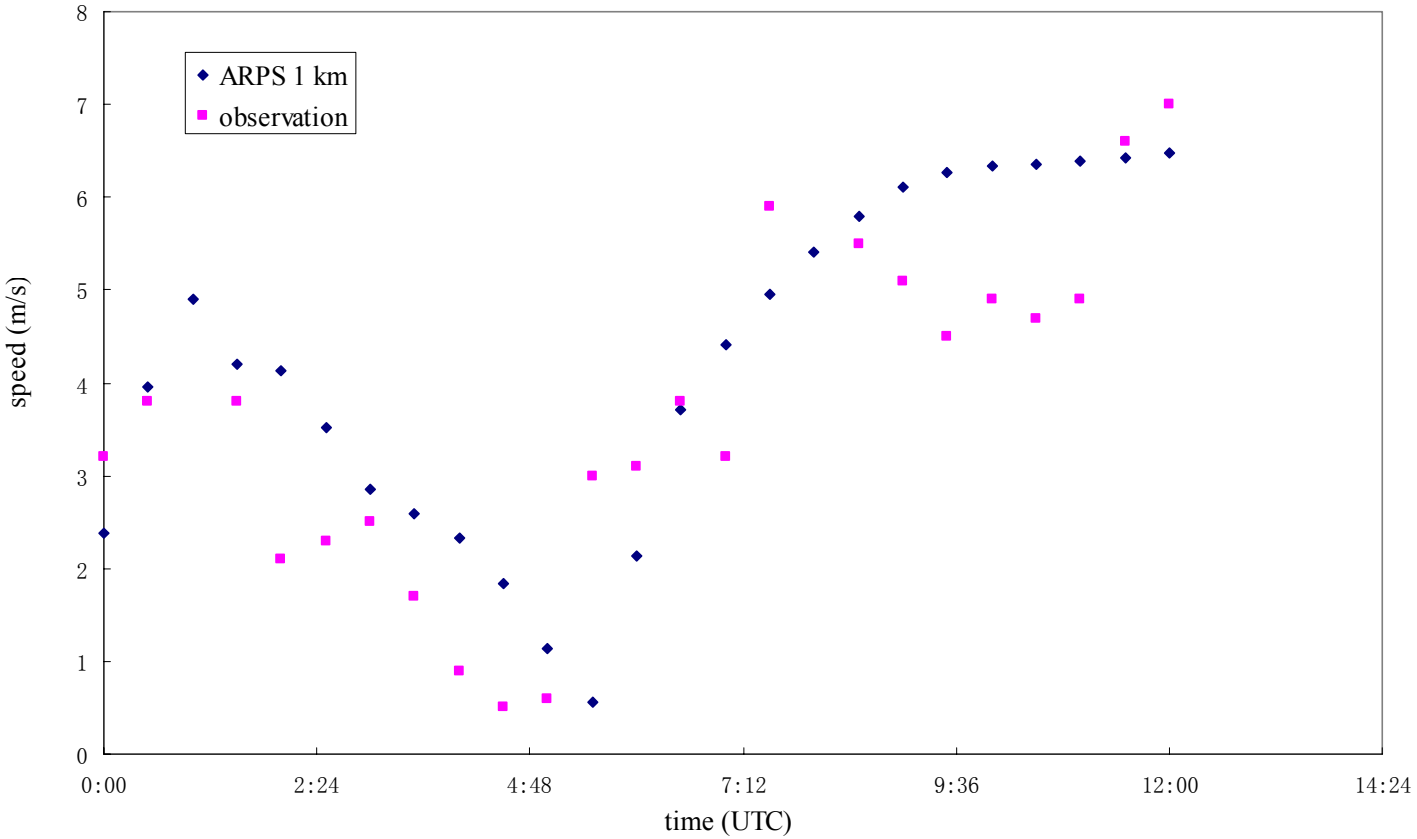
1. IOP 4:

   UTC 00 October 9 – UTC 12 October 9

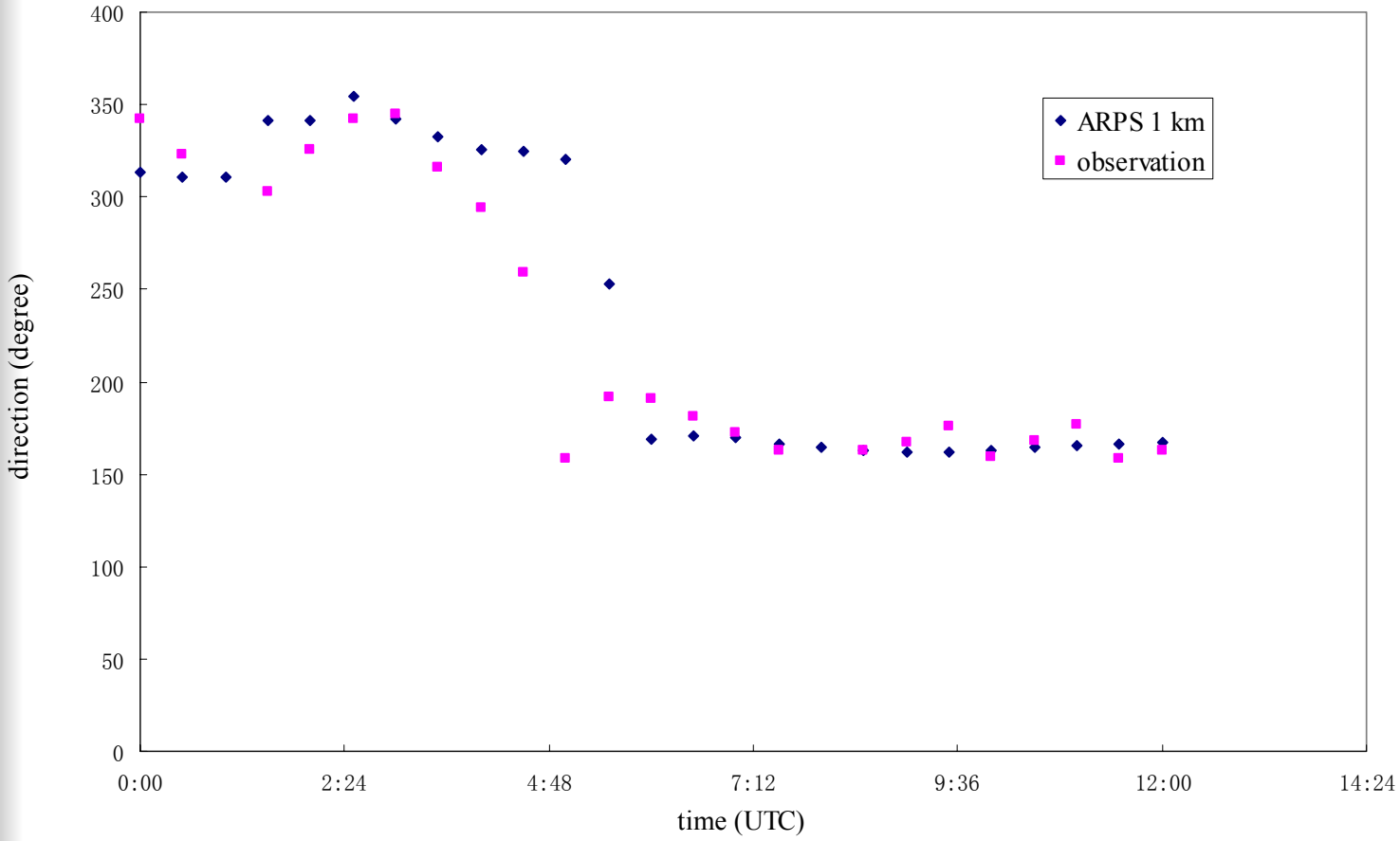
2. IOP 6:

   UTC 21 October 16 – UTC 12 October 17

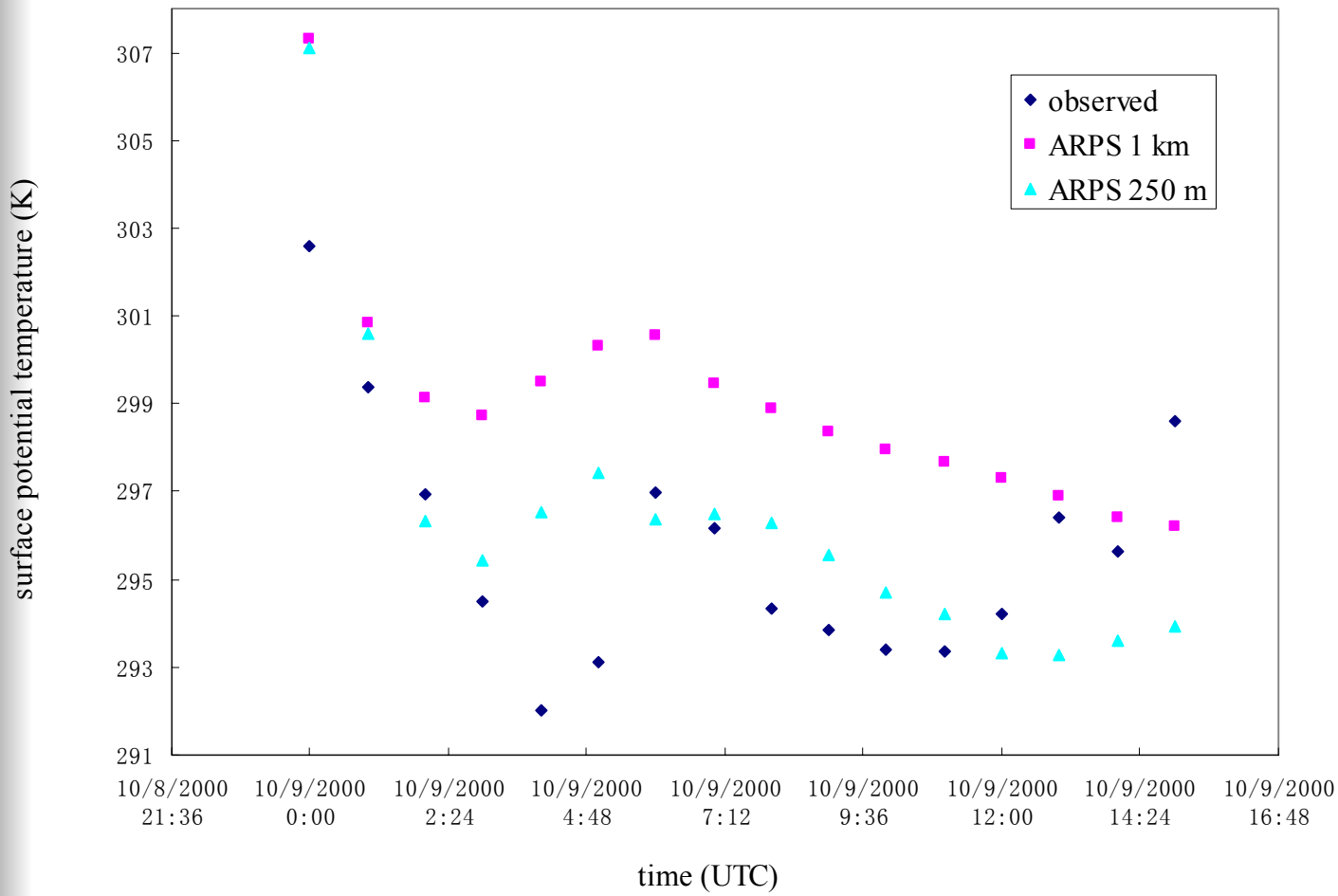
# Observed and simulated wind speed (50m AGL) at NCAR for IOP 4



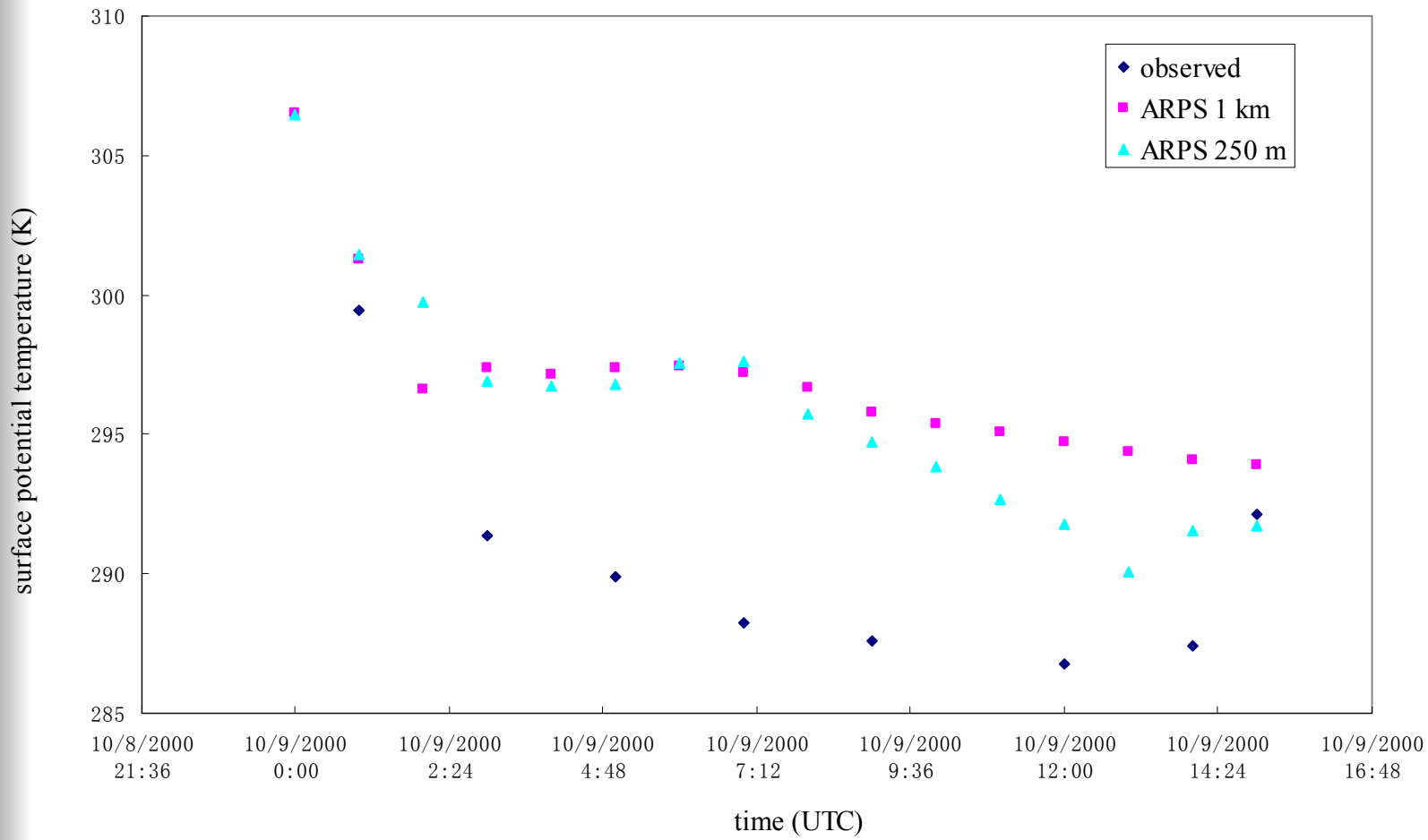
# Observed and simulated wind direction (50m AGL) at NCAR for IOP 4



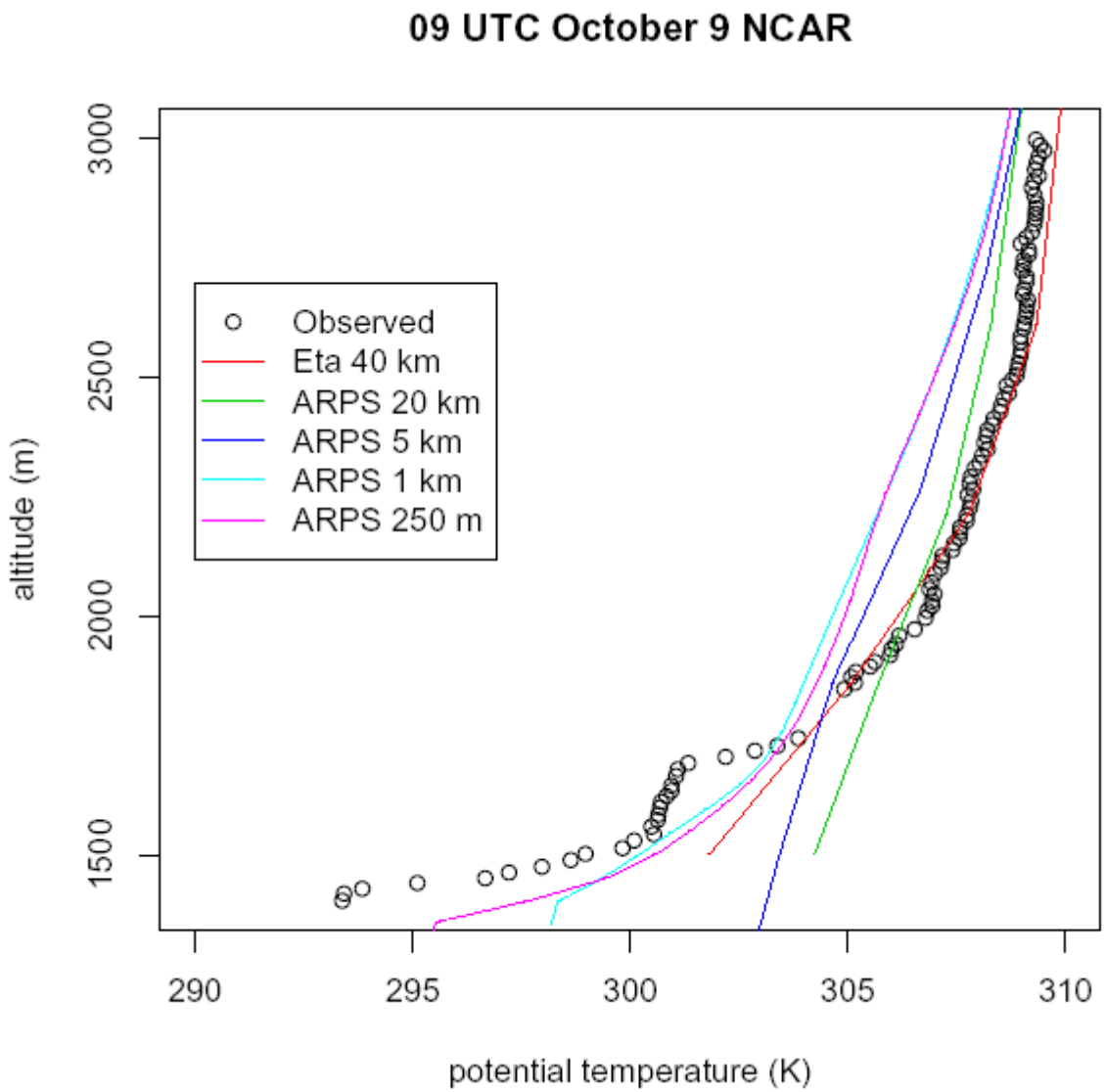
# Observed and simulated surface potential temperature at NCAR for IOP 4



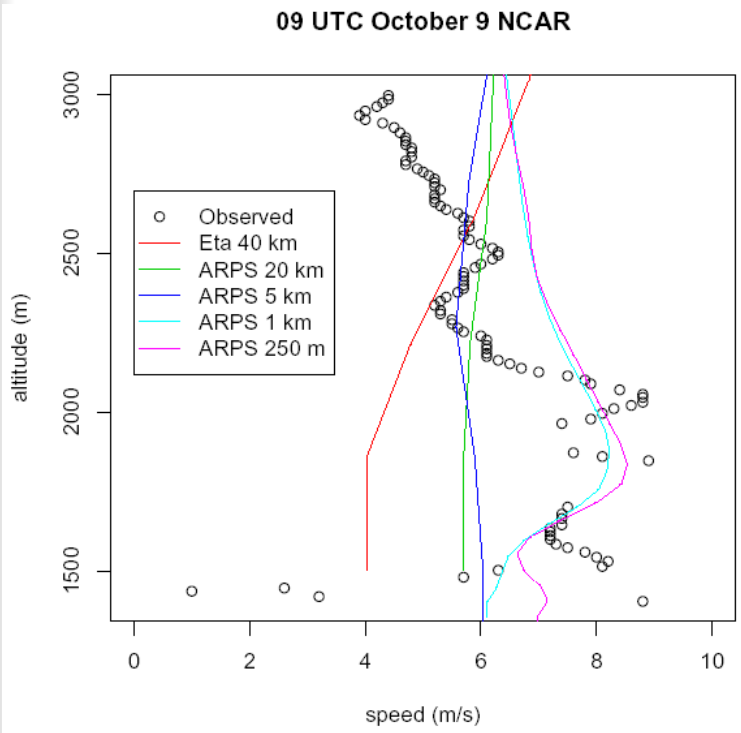
# Observed and simulated surface potential temperature at Wheeler Farm for IOP 4

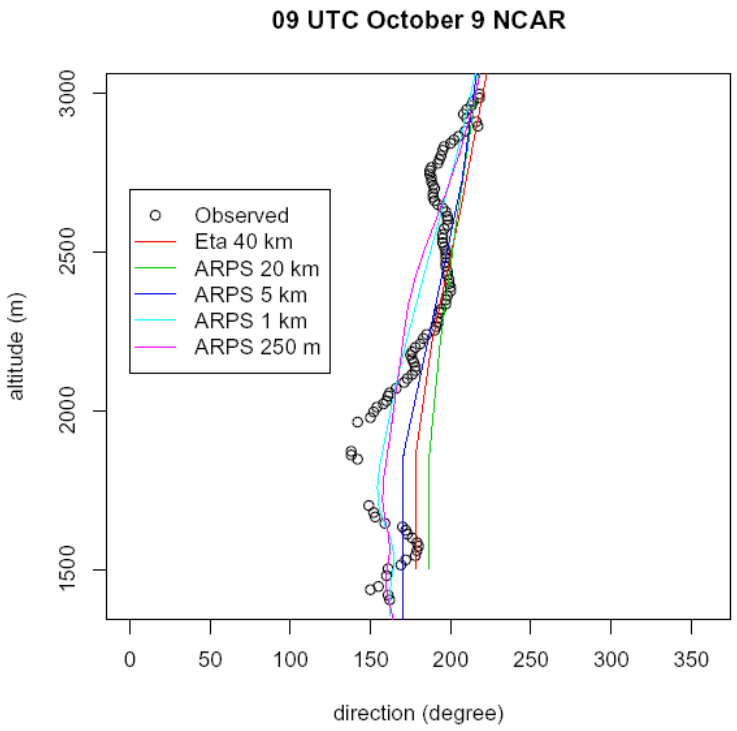


# Potential temperature at NCAR for IOP 4

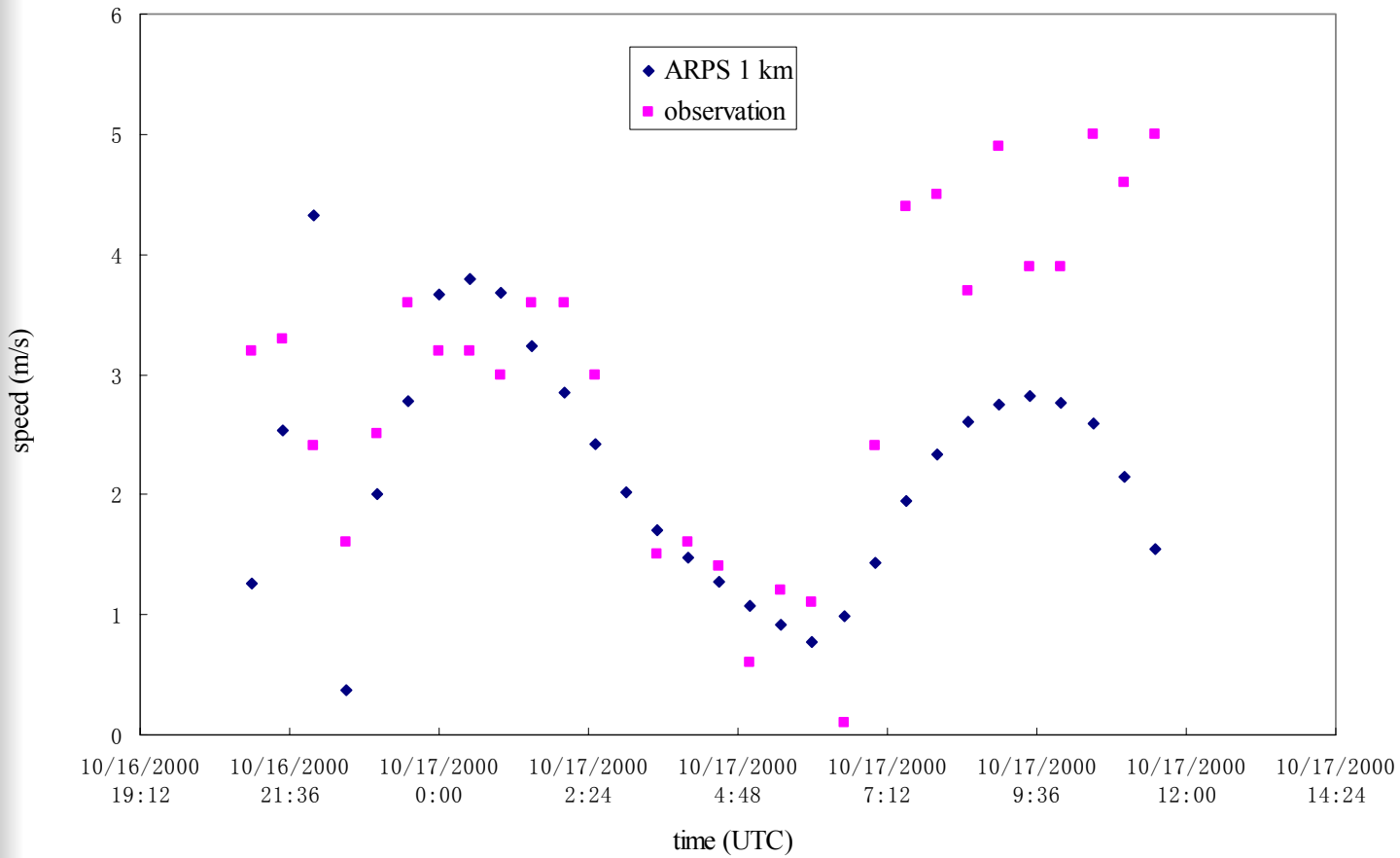


# Wind Speed and Direction at NCAR for IOP 4

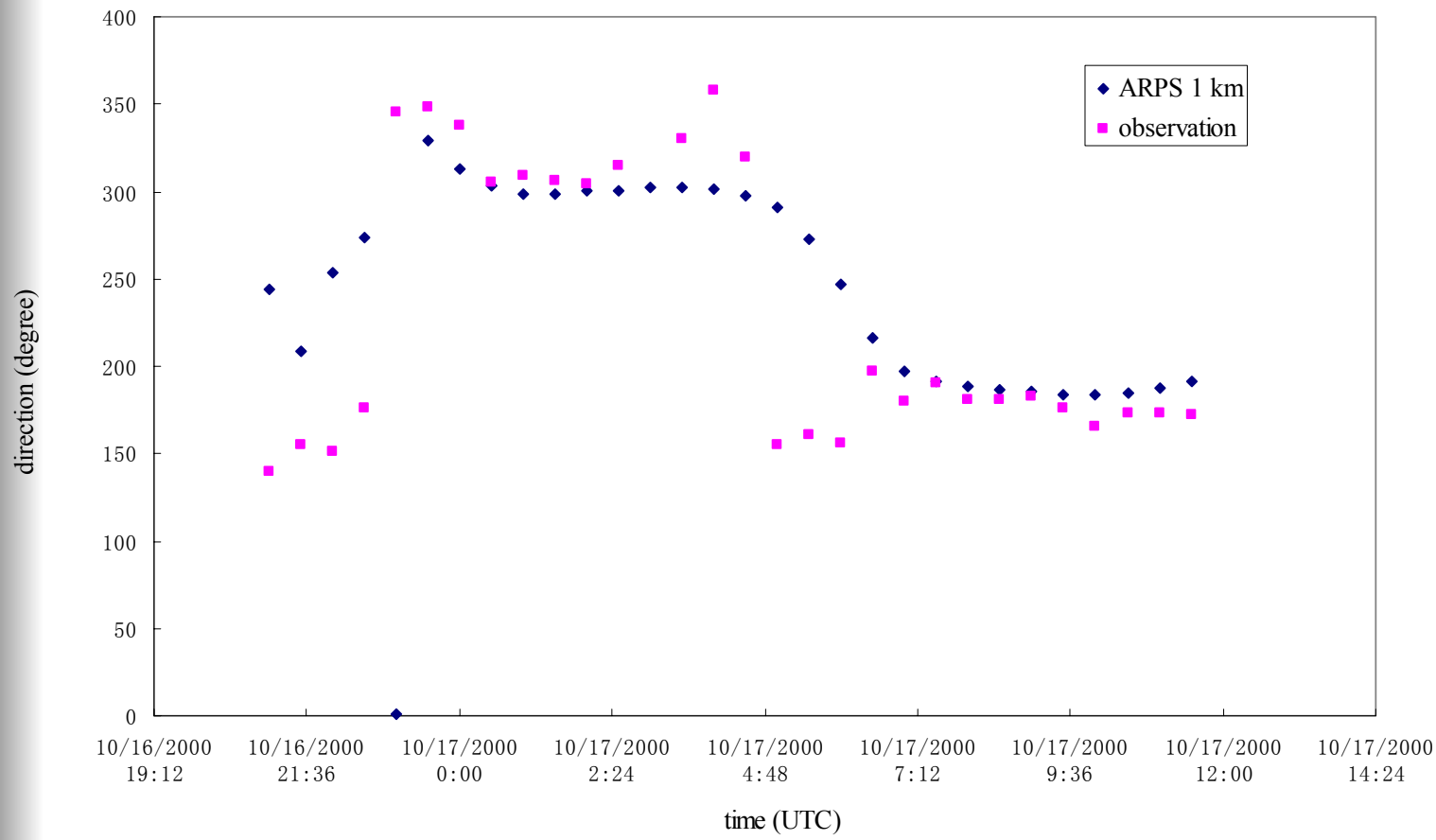


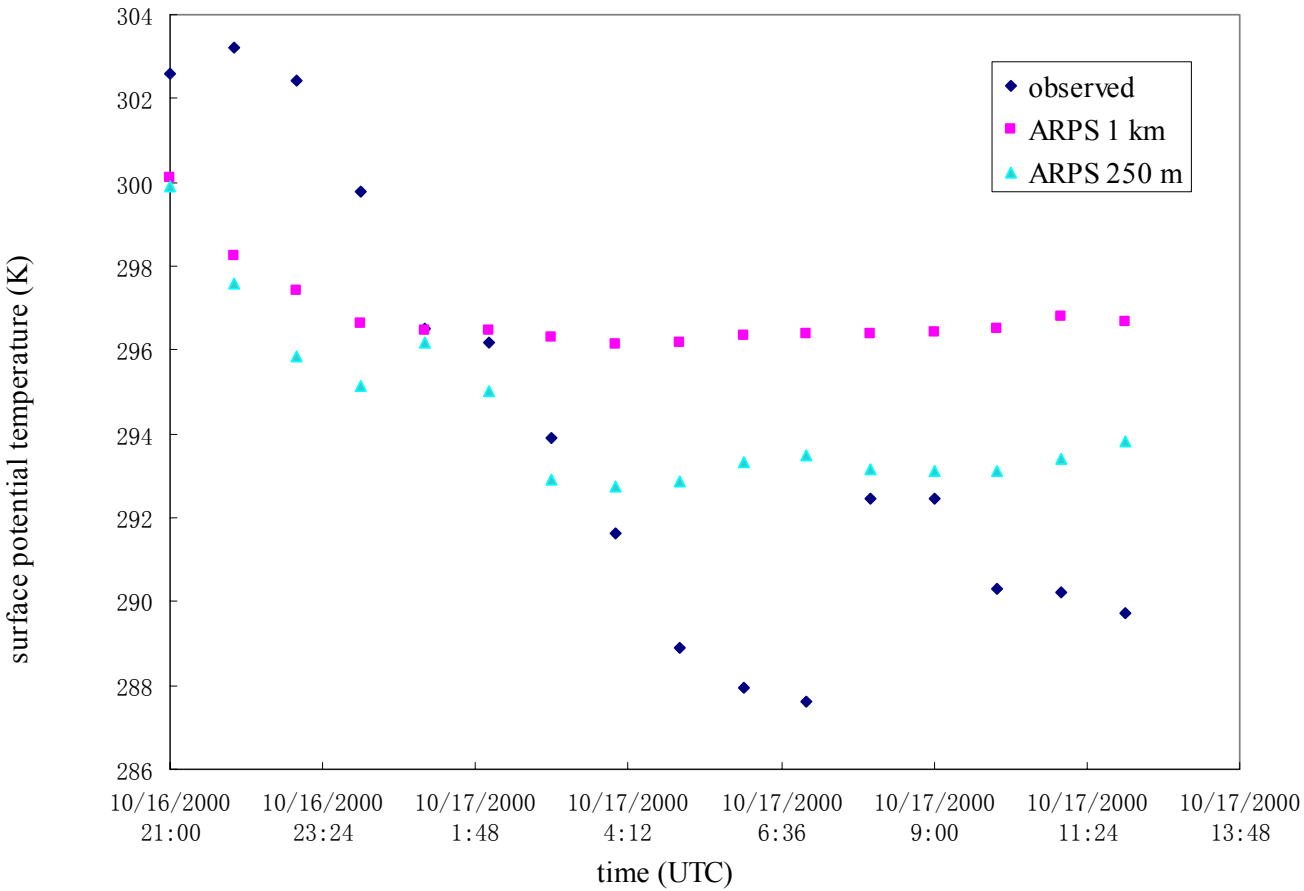
# Observed and simulated wind speed (50m AGL) at NCAR for IOP 6



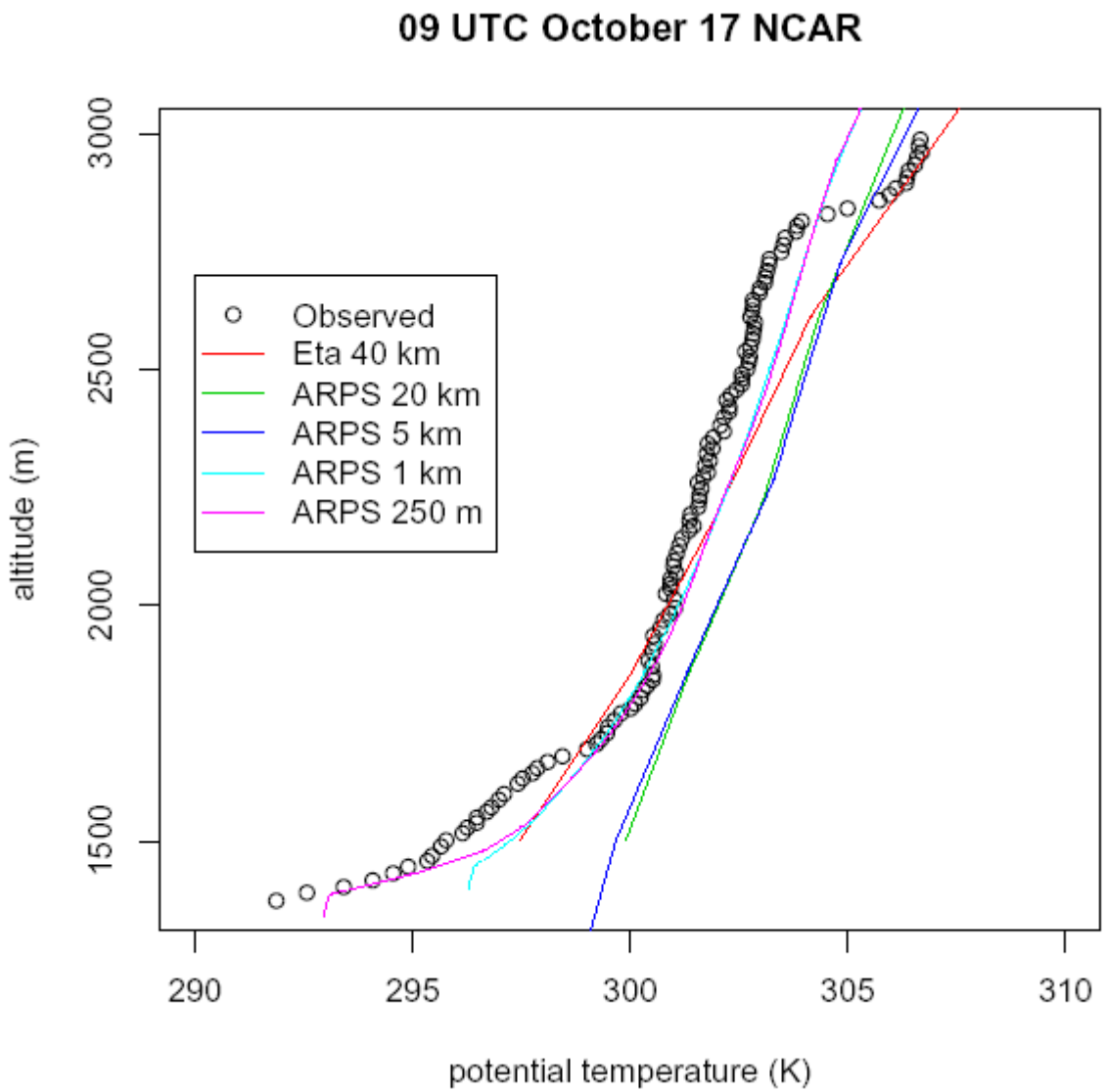
# Observed and simulated wind direction (50m AGL) at NCAR for IOP 6



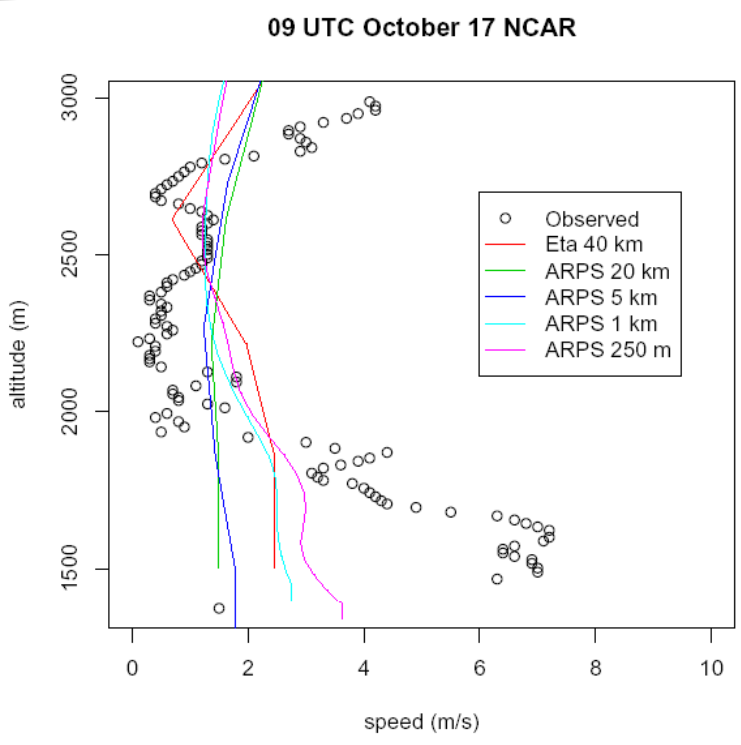
# Observed and simulated surface potential temperature at NCAR for IOP 6

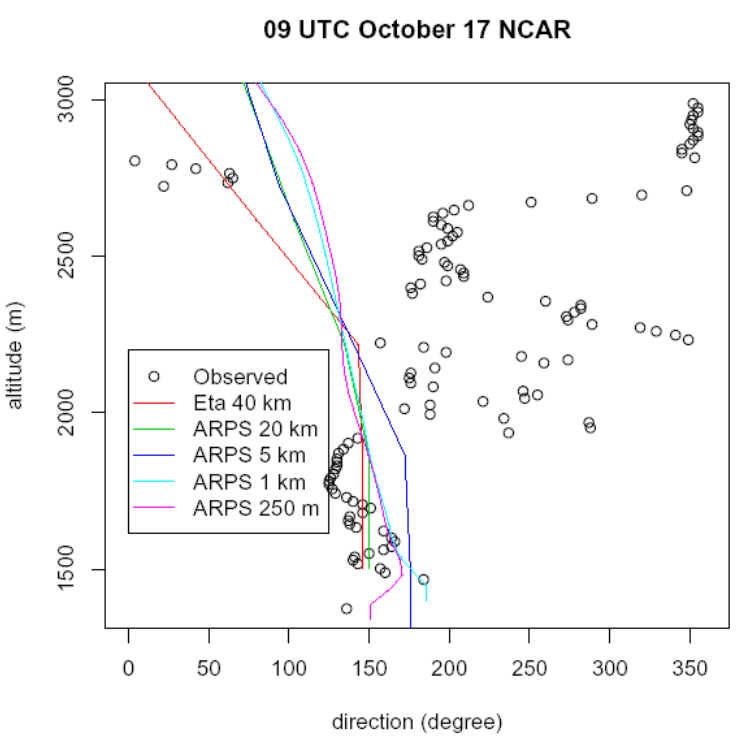


# Potential temperature at NCAR for IOP 6



# Wind Speed and Direction at NCAR for IOP 6

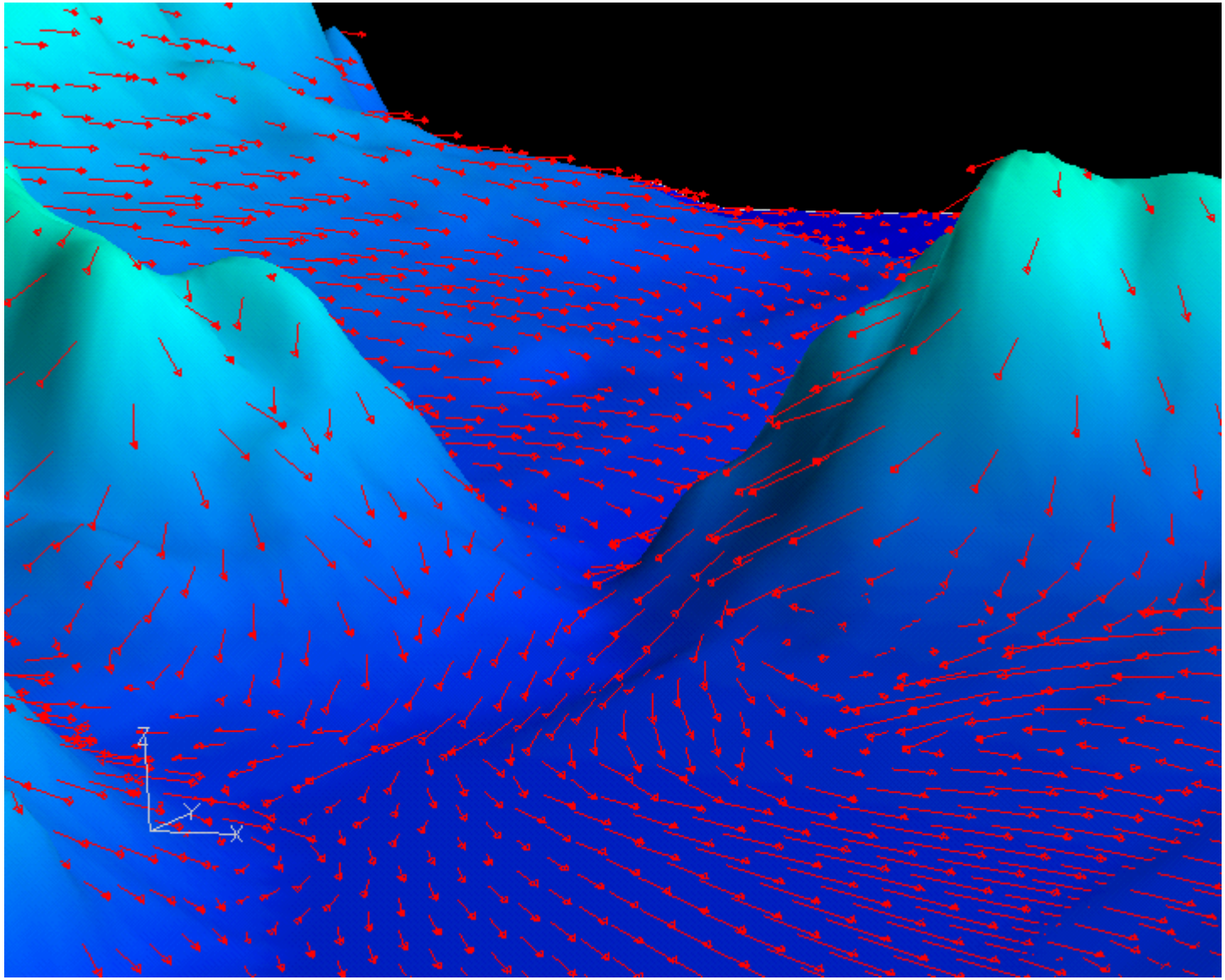


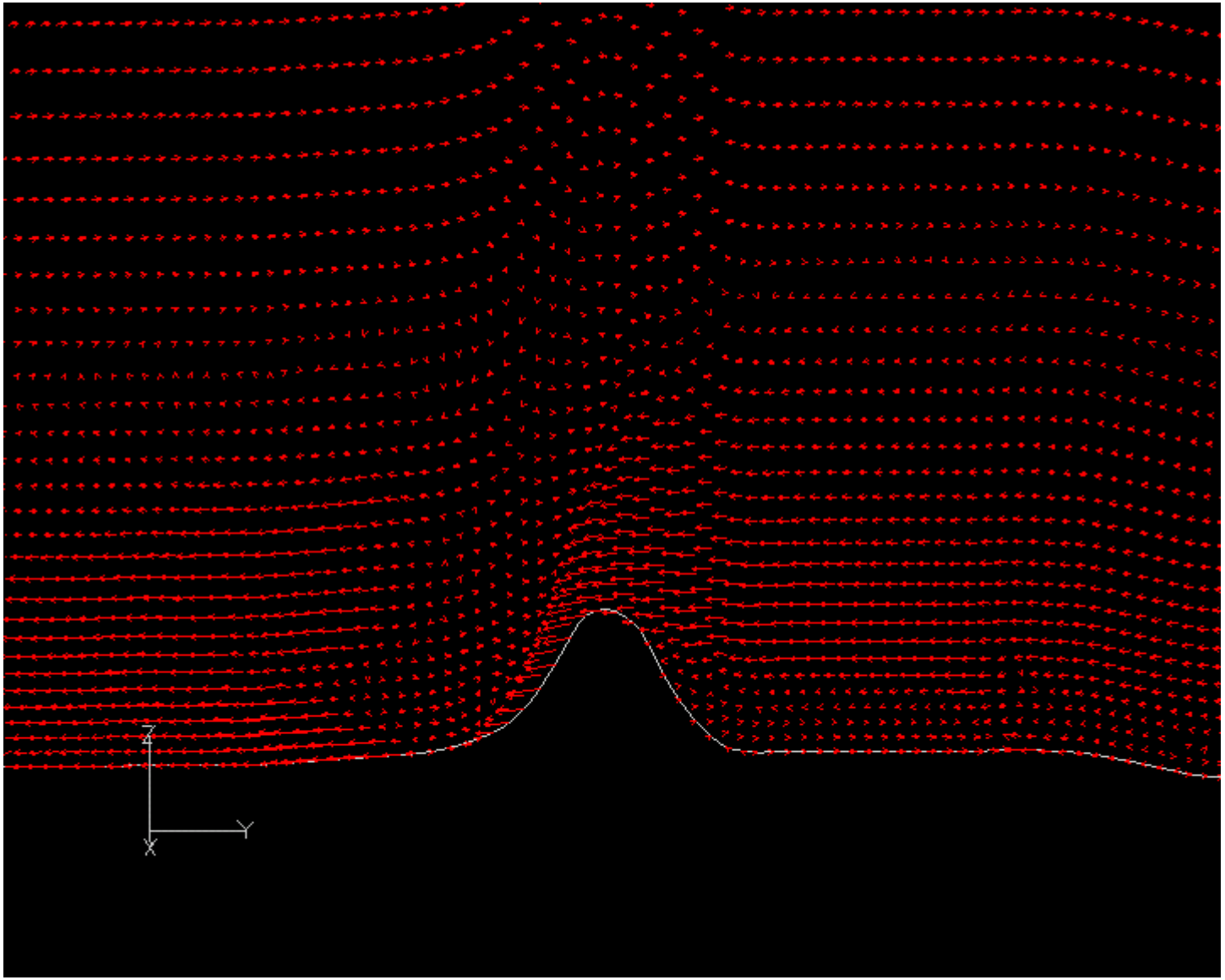



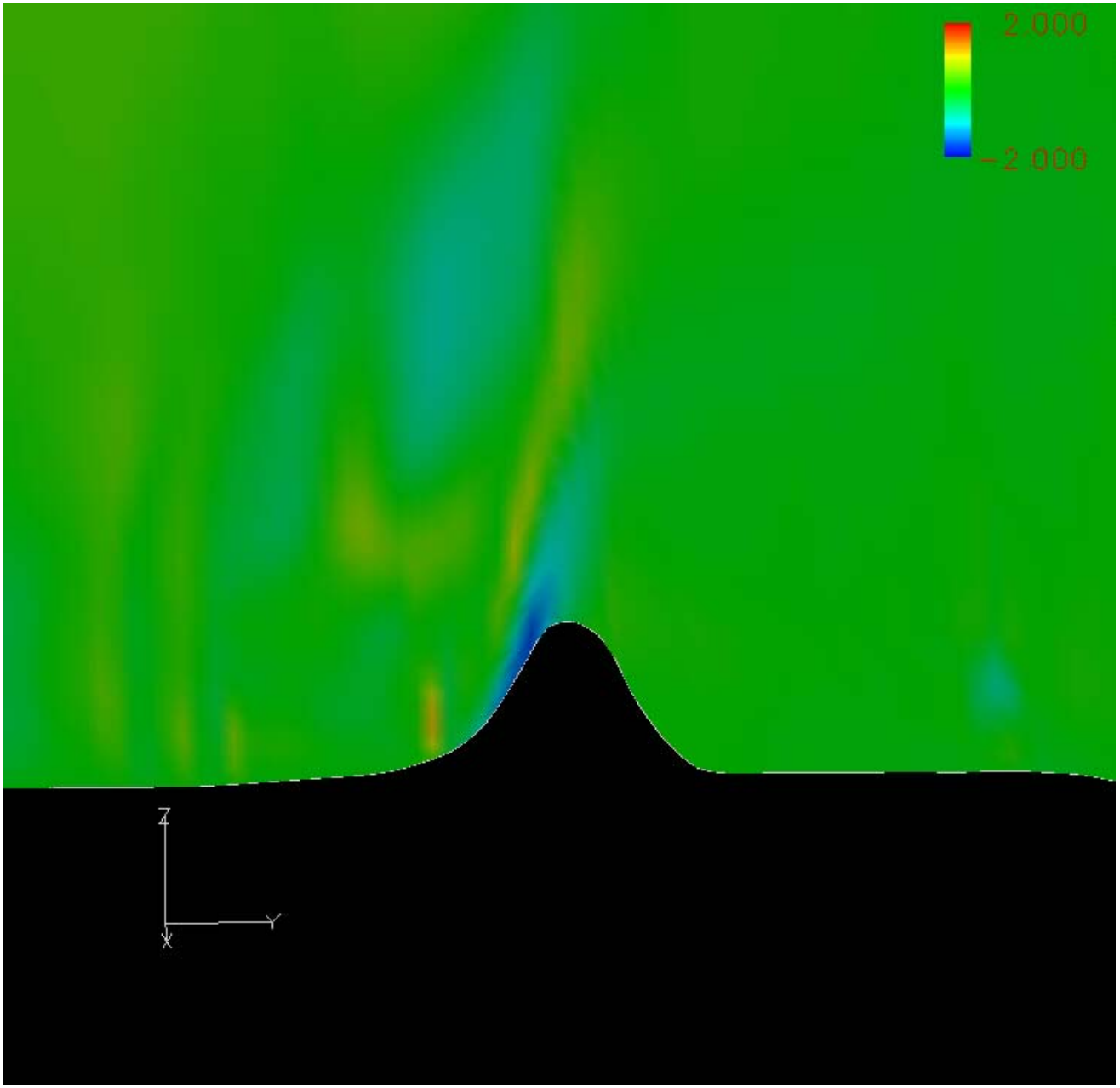
# Some animations for IOP 4

1. Surface wind field in the Jordan Narrows.
2. Wind profile at the cross-section parallel to Wasatch Mountains.
3. Vertical velocity profile at the cross-section parallel to Wasatch Mountains.

All are from 00 UTC to 12 UTC October 9 for every half an hour.


Z
Y
X


Z
Y
X


2.000
-2.000
Z
Y
X

# Acknowledgements

1. Many VTMX participants

2. The McCuen computing Center

3. The National Energy Research Scientific Computing Center

4. Prof. Ming Xue, the ARPS team