Script for EXP03: Polar vortex (due by Thursday, February 28)

* --------------- synopsis ------------------------------- *

This experiment revises the KANSAS example to simulate the late January
cold intrusion event and compares ASOS network-averaged predictions with
observations. Modifications will be necessary. The domain placement
is somewhat suboptimal.

Reference previous scripts, PPTs, and the WRF-REAL checklist.

* --------------- preliminaries ----------------------------- *

Create a directory called EXP03, and start with the $LAB/KANSAS/SETUP.tar file

Domain: e_we = 72, e_sn = 72, 36 km resolution, Lambert projection,
ref_lat = 42.5, ref_lon = stand_lon = -92.5, truelat1 = 30, truelat2 = 60

GFS data: identical copies (to possibly lighten data access contention) located at
$LAB/DATA/GFS_2019012918/gfs.*
$LAB/DATA/GFS_2019012918_COPY2/gfs.*
/rfovell/ATM419/GFS_2019012918/gfs.*

Start = 2019-01-29 18:00:00
End = 2019-01-31 18:00:00
Interval_seconds=10800

Edit namelist.wps and namelist.input accordingly.

For verification, start with the $ LAB/KANSAS/SETUP_MET.tar file
Don’t forget to
- Make directories postprd and wrfprd
- Move your wrfout* into wrfprd
- Edit run_unipost_frames and MET6_run_ASCII2_ASOS.sh (see KANSAS
Part 2 PPT for guidance)

ASOS observation data (two identical copies):
/network/rit/lab/atm419lab/DATA/MADIS/MADIS_20190129
/rfovell/ATM419/MADIS_20190129

Specific tasks
(1) Make a 48 h simulation (all WPS/WRF steps)
(2) Verify against ASOS network-averaged observations, as in KANSAS Part 2.
(3) Revise the 4-panel python plot program to put your name somewhere
  on the plot, make the plot, and send it to me

[see Notes, overleaf]
Notes:

- Worst-case scenario: pre-made ungrib outputs for this case at:
  
  $\text{LAB/DATA/COLD/UNGRIB.tar}$

- You will need to revise read_output3.py for temperature and dewpoint to plot usefully. The relevant code is bolded, and defines ranges of TMP and DPT. Putting a hash mark (#) on those lines would cause them to be skipped.

```python
if(fvariable[0:3] == 'TMP'):
    plt.ylabel('temperature (K),fontsize='small')
    plt.ylim([280,295])
elif(fvariable[0:2] == 'RH'):
    plt.ylabel('relative humidity (%),fontsize='small')
    plt.ylim([35,95])
elif(fvariable[0:4] == 'WIND'):
    plt.ylabel('wind speed (m/s),fontsize='small')
    plt.ylim([0,7])
elif(fvariable[0:3] == 'DPT'):
    plt.ylabel('dew point (K),fontsize='small')
    plt.ylim([276,281])
```

- To get your name somewhere on the plot, you might consider focusing on these lines

  ```python
  ptitle="Plot of " + fvariable + " (blk) and " + ovariable + " (red)"
  plt.title(ptitle,fontsize='medium')
  ```

- I encourage you to make a backup copy of the read_output3.py program before modifying. Keep in mind you have a copy in your KANSAS/KANSAS01 directory.

- You do not need to do the station-based analysis (unless you want to).