# Use of hmp\_purge\_times.py

This code plots temperature and relative humidity data from 6 days, at an interval specified by user input, from the CAO Vaisala HMP155A temperature and relative humidity sensor. This sensor performs a purge cycle for approximately 8 minutes at an interval specified by the user, currently once every 24 hours. During this cycle the temperature and relative humidity values remain at the value at the start of the cycle. We wish to flag these data in the ncas-temperature-rh-1 data files. The cycle slowly drifts with time, so it is part of the monthly quality control procedure to detect how its start and finish time has drifted through the month and make manual edits to the file /data/netCDF/corrections/hmp155\_purgetime.txt.

1. Check that Exceed is running on your Windows computer.
2. Open a Unix or Linux command window (a run-time environment such as Cygwin can be used if preferred, or a terminal window such as PuTTY).
3. Connect to the directory where the hmp\_purge\_times.py code is located (unless it is in your $PATH command, it which can you can run it from any directory).
4. Enter **./hmp\_purge\_times.py -s *yyyymmdd\_start* -x *separation of days* –f *start time for plot*.**

*yyyymmdd\_start* = first date for which you want to display data

*separation of days* = how far apart are the days to be plotted. If this is omitted the default is 5, sensible for considering 1 month of data

*start time of plot* = origin of x axis in decimal hours. A 30 minute period will be plotted.

If you don’t know a sensible start time to use, look at previous plots in <https://gate.chobs.rl.ac.uk/amof-netCDF/ncas-temperature-rh-1_v1.0/index.html> which will show the previous identified purge times flagged by circular red markers. If the HMP155A sensor has been power cycled recently, the purge will be at the same time as it was powered up, although then drifting slightly earlier each day.

1. For example ./hmp\_purge\_times.py –s 20210701 –x 5 –f 9.2



The purge periods can easily be seen as flatter regions, more clearly in the lower relative humidity plot. The order of colours in shown in the header and the dates of each plot are shown in the text window. In this case they are:

Date = 20210701

Date = 20210706

Date = 20210711

Date = 20210716

Date = 20210721

Date = 20210726

1. View the graph and determine what 0.2 hour intervals best cover the purge periods as the month progresses. It is something of a matter of judgement but in this case I edited the end of the hmp155\_purgetime.txt to be:

…

20210630 235950 20210707 235950 9.45 9.65

20210707 235950 20210717 235950 9.4 9.6

20210717 235950 20210722 235950 9.35 9.55

20210722 235950 20211231 235950 9.3 9.5

The columns are:

1. Start date for chosen purge time
2. Start time for chosen purge time – normally the end of the day so that in practice it begins at the next data point which is the start of the next day. It should be the same as the previous end time.
3. End date for chosen purge time
4. End time for chosen purge time – normally the end of the day
5. Purge start time (decimal hours)
6. End purge time (decimal hours)

Normally 0.2 hours is a long enough period to cover the purge cycle.

It is best to set the last end date well in the future, so that there is a time slot which catches future data, before you assess corrections for future months.

The purge times set in the file will then be applied to the ncas-temperature-rh-1 files when generated using generate\_days\_netcdf\_metsensors.py.