Convert vol files to cfradials
- ❖ run *convert-chilbolton-x-band-time-series.sh*
    - ➢ CALLS *convert-chilbolton-x-band-day.sh*
        - ■ CALLS *convert-chilbolton-x-band-hour.sh*

Uses *chil_defaults.cfg*, *get-input-files.sh* and *setup-env.sh*

Example usage:
convert-chilbolton-x-band-time-series.sh -t vol -s 20181025 -e 20181231

These scripts were run using LSF/bsub (before the change to SLURM)

INPUT: */gws/nopw/j04/ncas_obs/amf/raw_data/ncas-mobile-x-band-radar-1/data/chilbolton/*

Also the parameters file for RadxConvert:
/home/users/lbennett/lrose/ingest_params/chilbolton/nov2019/RadxConvert.chilbolton.uncalib

OUTPUT: */gws/nopw/j04/ncas_radar_vol2/data/xband/chilbolton/cfradial/uncalib_v1/*

STEP 2
Process the uncalibrated cfradials to calculate offsets for ZDR (same methodology as that written up in raine directory, see pdf there)
- ❖ Run *process_chil_vert_scans.sh*
    - ➢ CALLS *process_chil_vert_scans.py*

INPUT: */gws/nopw/j04/ncas_radar_vol2/data/xband/chilbolton/cfradial/uncalib_v1/vert/*
OUTPUT: */gws/nopw/j04/ncas_radar_vol2/data/xband/chilbolton/calibrations/ZDRcalib_2020/*

- ❖ Run *process_chil_hourly_zdr.sh*
    - ➢ CALLS *process_chil_hourly_zdr.py*

INPUT: */gws/nopw/j04/ncas_radar_vol2/data/xband/chilbolton/calibrations/ZDRcalib_2020/*/day_ml_zdr.csv*
OUTPUT:
/gws/nopw/j04/ncas_radar_vol2/data/xband/chilbolton/calibrations/ZDRcalib_2020/*/hourly_ml_zdr.csv

Use notebook *plot_chil_zdr_full_series.ipynb* to plot the results and calculate biases

STEP 3
Process the uncalibrated cfradials to calculate offsets for Z (same methodology as that written up in raine directory, see pdf there)

- ❖ Run *process_chil_dbz.sh*
    - ➢ CALLS *process_chil_dbz.py*
        - ■ CALLS *calibrate_day_att* in *calib_functions.py*

INPUT: */gws/nopw/j04/ncas_radar_vol2/data/xband/chilbolton/cfradial/uncalib_v1/sur/*
OUTPUT:
/gws/nopw/j04/ncas_radar_vol2/data/xband/chilbolton/calibrations/Zcalib_2020/phi_files/110620_att/
/gws/nopw/j04/ncas_radar_vol2/data/xband/chilbolton/calibrations/Zcalib_2020/phase_files/

Use notebook *plot_chil_zcalib.ipynb* to plot whole time series and estimate a bias for the project.

Use *plot_chil_initial_phase.ipynb* to examine changes in initial differential phase

STEP 4
Apply the calibration offsets to the data

The Chilbolton dataset is a bit complicated as we determined 8 different sets of offsets to be applied for 8 different time periods.
It was also the first set of data to be processed using the SLURM software rather than LSF, so there were changes to the code for this.

❖ Run *calibrate_chilbolton_by_date.py* or *calibrate_chilbolton.py*
  ➢ CALLS *calibrate_chilbolton.sh*
    ■ CALLS *calibrate_chilbolton_chunk.sh*

The *by_date* python script allows you to specify whichever date range you want to process, which makes it easier for testing small batches of data first.
The other script will process **all data** for a predetermined time period, which are the 8 periods with different offsets and are set explicitly in the script.

Example usage:

python calibrate_chilbolton_by_date.py start_time end_time scan_type params_index

python calibrate_chilbolton_by_date.py 20170515090847 20170515094914 sur 2

Where the date strings correspond to the start and end days/times, sur is the scan_type and the params_index refers to which parameters file to use:
/home/users/lbennett/lrose/ingest_params/chilbolton/june2020/RadxConvert.chilbolton.calib.0X

The python script finds all the data files for the specified time period and then breaks them into equal "chunks". For example, for vol files which are the largest files (~40-70MB), we split into 6-hourly chunks, which equates to approximately 60 files for each chunk. Each chunk of files is submitted to SLURM for processing.

INPUT: */gws/nopw/j04/ncas_radar_vol2/data/xband/chilbolton/cfradial/uncalib_v1/*
OUTPUT: First written to scratch */work/scratch-nopw/lbennett/chilbolton/calib_v2/*
and then immediately copied to the GWS
/gws/nopw/j04/ncas_radar_vol2/data/xband/chilbolton/cfradial/calib_v2

Log files are written to:
/gws/smf/j04/ncas_radar/lbennett/logs/
Lotus output files are written to:
/gws/smf/j04/ncas_radar/lbennett/lotus-output/