The processing consists of three different steps.

1. Pre-processing routine
   1. Read partial hours of raw spectra in netCDF and save as hourly matlab files
2. Main processing routine
   1. Read hourly raw spectra files
   2. Declutter spectra
   3. Estimate multiple-peak moments on decluttered spectra at original time resolution
   4. Construct 15-s shift-and-average spectra
   5. Estimate multiple-peak moments on 15-s averaged spectra
   6. Concatenate hourly files into daily matlab files
3. Post-process routines
   1. Read daily matlab processed files and save in netCDF format
   2. Generate daily and hourly plots using netCDF data files

Directory Structure

Before processing these routines, define these directories:

./images\_15sec\_ave\_moments - images generated after processing day of data

./images\_from\_nc\_files/daily - daily images generated from netCDF files

./images\_from\_nc\_files/hourly - hourly images generated from netCDF files

./m\_files - put all matlab m-files (routines) in this directory

./mat\_15sec\_ave\_moments - hourly files, moments estimated from 15s averaged spectra

./mat\_15sec\_ave\_spc - hourly files, 15s averaged spectra

./mat\_clutter\_stats - hourly files, clutter statistics

./mat\_daily\_15sec\_ave\_moments - daily files, concatenation of hourly moment files

./mat\_dcl\_mom - hourly files, decluttered moments for each profile

/mat\_hourly\_spc\_files - hourly raw spectra files in matlab format (input files for main routine)

./mat\_orig\_mom - hourly files, moments before decluttering spectra

./nc\_daily\_15sec\_ave\_moments - daily netCDF files of 15sec averaged moments

./raw\_netCDF - raw spectra in netCDF format (downloaded from ARM archive)

./temp - temporary files are stored and then deleted after processing each day

**Pre-Processing Routine**

Routine: **main\_make\_oli\_hourly\_mat\_spc\_kazr\_ge\_copol\_2018\_0606.m**

This pre-processing routine reads partial hours of raw spectra written in netCDF format and saves the spectra in hourly matlab files. This routine enables the main processing routine to work with complete hours of data.

Functions needed for this routine:

func\_convert\_netCDF\_time\_to\_vector.m

func\_copy\_spc\_from\_archive\_to\_local\_disk\_kazr\_ge\_2018\_0427.m

func\_delete\_local\_copy\_of\_spc\_kazr\_ge\_2018\_0427.m

func\_get\_hourly\_spc\_into\_mat\_kazr\_ge\_copol\_2018\_0427.m

func\_read\_kazr\_netCDF\_file\_no\_spectra.m

func\_read\_kazr\_spc\_time\_in\_netCDF\_file.m

Directories needed for this routine:

/raw\_netCDF - directory containing multiple days of raw spectra in netCDF format (downloaded from ARM archive)

/temp - directory to store daily raw spectra. Spectra deleted from this directory after processing day of spectra.

**Main processing routine**

Routine: **main\_make\_oli\_hourly\_mat\_spc\_kazr\_ge\_copol\_2018\_0606.m**

This routine processes the Oliktok Point KAZR spectra as described in the Williams et al. (2018) AMT manuscript.

Functions needed for this routine:

func\_calc\_multi\_peak\_ge\_moments.m

func\_calc\_Vmean\_var.m

func\_declutter\_spc.m

func\_find\_mean\_HS\_noise.m

func\_find\_moments.m

func\_find\_multi\_mom\_3spc\_Vmean\_prior.m

func\_find\_noise\_adjusted\_zdb\_and\_snr.m

func\_find\_single\_peak.m

func\_find\_single\_peak\_Vmean\_prior\_valley.m

func\_ge\_ave\_spc\_to\_15sec\_and\_calc\_mom\_and\_save\_spc.m

func\_incoherent\_ave\_spc\_valid\_obs.m

func\_make\_daily\_mat\_files.m

func\_plot\_15sec\_kazr\_ZVSkew\_mom\_ge\_copol.m

func\_plot\_15sec\_kazr\_VZW\_mom\_ge\_copol.m

func\_shift\_then\_ave\_spc.m

**Post-Processing Routines**

Routine: **main\_save\_daily\_ge\_15sec\_all\_mom\_as\_netCDF\_2018\_0718.m**

This post-processing routine reads the daily matlab file and generates a daily netCDF file.

Functions needed for this routine:

func\_remove\_isolated\_pixels\_3x3.m

func\_replace\_Nstd\_nos\_with\_NaN.m

func\_save\_ge\_all\_mom\_in\_netCDF.m

Routine: **main\_plot\_ge\_15sec\_mom\_nc\_all\_ZVW\_2018\_0718.m**

This post-processing routine reads the daily netCDF file and generates daily and hourly images.

Functions needed for this routine:

func\_fill\_time\_gaps\_with\_NaN\_profiles.m

func\_read\_nc\_file.m