PATMOS-x High Level Flowchart for the main executable *clavrxorb*

Read in user-defined options

- Begin
- Access Modules
- Declare local variables
- Read and quality check user defined options from command line or OPTIONSLIST
- Open high spatial resolution ancillary data files
- Read file directories in FILELIST

Begin loop through AVHRR/VGAC orbits listed in FILELIST (note: processing will be for AVHRR+HIRS or VGAC+CrIS)

Retrieve ancillary data required for calibration and RTM calculations

- Read HIRS/CrIS Fusion file name from FILELIST
- Prepare to read level-1b: Based on HIRS/CrIS fusion file name, determine if collocated AVHRR/VGAC level-1b file exists, what type it is and create pixel arrays
- Read AVHRR/VGAC header
- Read AVHRR/VGAC and HIRS/CrIS sensor constant files
- Open sensor specific ancillary data
- Open non-static high resolution ancillary data
- Read in NWP data (GFS or NCEP Reanalysis)
- Populate or Read other lookup tables
- Interpolate clock error for this orbit

Begin loop over orbit segments

Read in sensor data and perform RTM calculations

- Read AVHRR/VGAC level-1b and HIRS/CrIS fusion data
- On first segment, define output files
- Recompute geolocation
- Compute pixel-level arrays to receive ancillary data and generate masks for bad or unprocessible data
- Interpolate ancillary data to each pixel in this segment
- Compute NWP mapping and RTM values for each pixel in segment

Cloud algorithms

- Spatial metrics processing
- Generate Cloud Mask (note: HIRS/CrIS channels allows for additional cloud tests and ACHA retrieval modes)
- Generate pixel-level products
  - ACHA Algorithm – Cloud Temperature and Cloud Emissivity
  - DCOMP Algorithm- Cloud Optical Thickness and Cloud Particle Size

Write to output files and deallocate resources

- Write to output files (pixel-level)
- RTM Structure Memory Deallocation
- *End of loop over orbital segments*
- Close output pixel-level files
- Close non-static ancillary data files
- Deallocate remaining arrays
- *End loop over files*
- Close FILELIST
- Close static ancillary data files
- Final remaining memory deallocation
- End of code