

# HIRDLS

SW-HIR-2014

## HIGH RESOLUTION DYNAMICS LIMB SOUNDER

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Subject/Title: H2GMC\_Driver

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Description/Summary/Contents

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This module collocates the GMAO data for later use in the L2 processor.

H2GMC – “GMAP Collocator” – Part of CLG step – Creates time/lat/long collocated climatology and apriori files from gridded input files.

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Keywords:

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Purpose of this Document:

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## **H2GMC\_Driver**

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This module collocates the GMAO data for later use in the L2 processor. For each of the HIRDLS locations, it collocates the GMAO to this location. In addition, it collocates profiles to the 6 LOS locations associated with each HIRDLS location – for a total of 7 GMAO profiles/HIRDLS location. The HIRDLS location is the middle profile out of the 7 profiles for each time and there are 3 LOS locations on either side.

This processor can handle GEOS5 forecast data, GEOS5 72 level hybrid eta data, GEOS5 36 level pressure data as well as GEOS4 data. The data used is controlled by flags set in the user setup file (USF) and then passed to the CFG file by the rl2 run script.

Note that as of Fall 2011, GMAO is changing their forward-processing output data products. They have not indicated that they will retro-process 2005-2007. This code would need to be modified to handle the new data if it becomes available and is deemed to be useful.

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Open and read the HIRRAD file

Create the output HIR2CLCG file using the information from the HIR2CLCG definition file

Based on the type of GMAO data requested, open, read and close the appropriate files

For each pressure level, boxcar smooth the temperature data long the lat/lon plane, if requested – H2GMC\_Smooth

Loop over all profiles

Take the HIRDLS view direction for each profile and use the H2LSP\_loclos routine to calculate the latitude/longitude locations of each point along the line of sight – H2GMC\_CalcLocPsis

Interpolate the data to the line of sight locations – H2GMC\_Interp4D

(Note that H2GMC\_Interp3D calls still remain to calculate GMAO data on pressure surface, but this is inactivated)

Write out the HIR2CLCG file – H2GMC\_WriteCLCG

Close all of the files

## **H2GMC\_Interp4D**

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Interpolate the input gridded GMAO data to the input HIRDLS profile latitude, longitude, pressure and time.

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Calculate time grid indices and weight for HIRDLS times – H2GMC\_GetWeight

Loop over psis

Get latitude/longitude grid indices and weight for HIRDLS locations – H2GMC\_GetWeight

Retrieve the altitude profiles at every corner point (time, lat and lon corners)

At each latitude/longitude corner

Loop over altitudes

index                      Check that target altitude is within range of gridded altitudes and find the

If valid points in grid

If the species is H2O or O3 take the natural log of the data

Perform the interpolation at each lat/lon corner

Else

Set the data value at the lat/lon corner to missing

Loop over altitudes

If any of the lat/lon corner points are missing

Set output data at that location to missing

Else

Perform bilinear interpolation of four lat/lon corners to data location