IRIS 8.12.9 Release Notes (15 July 2011)

These notes cover changes made in IRIS since release 8.12.8 of 10 February 2011. If you are upgrading from an earlier release, please read those notes also. Revised to svn [26895].

Important Upgrade Notes

1. One of the important new features in release 8.12.9 is support for the new Red Hat Enterprise Linux, version 6. There are lots of changes to our installation instructions. Be sure to use a new version of our *Software Installation Manual*. Appendix G covers installing Red Hat version 6, and appendix A covers installing Red Hat version 5. The install disk for RHEL6 now contains options to install on disk drive sda, sdb, or sdc. Also, there is no installation number required for RHEL6.

2. The release media no longer includes an IRIS release for RHEL4. If you have an RHEL4 IRIS machine, you will have to upgrade the OS before upgrading to the new version.

3. We have new Vaisala supplied OS install images for RHEL6, RHEL5.5 and RHEL5.4. These are dated 2 June 2011. If you are installing using our disk, be sure to get a new one. You can download these from our ftp site, for example at:

   ftp://ftp.sigmet.vaisala.com:/outgoing/releases/install_2011_06_02/RHEL6.0/install_image.iso

4. When upgrading, you need to install the libgeotiff and proj4 rpms. This will automatically happen on a new installation when you run **sigconfig**. When upgrading, please install them manually. These are supplied on our installation media, and are also available on our ftp site. To install:

   ```
   # rpm –Uvh proj–4*.vel5.i386.rpm
   # rpm –Uvh libgeotiff–*.el5.i386.rpm
   ```

5. On new installations, we are now creating a default radar operator account called "**radarop**". Previously we created an account called "**operator**". We made this change because Linux comes with a pre-configured non-login "operator" account, which we do not want to interfere with. Many files will still be owned by operator, this is OK. All IRIS daemons will normally run with user=operator, and real-user=root. This requires some changes as outlined here:

   ### If you did a new Red Hat install:

   Just follow the instructions in the current *Software Installation Manual*. Note that for network copies between new IRIS machines, be sure to specify the user name as "radarop".

   ### If you did not do a new Red Hat install:

   If the system previously had a Vaisala supplied operator account, you can leave it that way. However you will need to log into your operator account and copy your ssh key files to the /root directory, as follows:

```
$ cd
$ cd .ssh
$ cp id_dsa* /tmp
$ su –
# mkdir –m 700 .ssh
# cd .ssh
# cp /tmp/id_dsa* ./
```

Next log out and in again as root for the new ssh keys to take effect:

```
# exit
$ su –
```

Now test by trying a simple command like:

```
# ssh operator@targethost date
```

The first time this is run, it will ask you to confirm the target host. After you get this working, delete the temporary file copies:

```
# exit
$ cd /tmp
$ rm id_dsa*
```

If you are running a mixed environment:

In addition to the above steps: If you are copying to a machine with the login operator account, specify the username as "operator". If you are copying to a machine with the non-login operator account, specify the username as "radarop".

Also in a mixed environment, you will need to authorize IRIS menu connects for both the operator and radarop login account. The new systems will automatically allow both. On the old "operator" systems, you need to edit your /etc/sigmet/profile.conf file to add "radarop" to the list of operators.

Why does my scp work from the shell, but fail from the Product Output Menu?

There are two common reasons:

#1 You must use exactly the same hostname, that is if you are copying with:

```
$ scp file username@hostname:/directory
```

Make sure that the username, hostname, and directory are the same in **setup**. A common problem is to use hostname.domain in one case, or use an IP address in one case. The problem is that the .ssh/known_hosts file must match the hostname exactly.

#2 You are not running the shell scp while logged in as root. Recall that the IRIS daemons run as root, so you must test with:

```
$ su –
# scp file username@hostname:/directory
```

6. *RHEL5 sytems only:* As part of internationalizing our code, we have changed the font used in the IRIS menus, as well as in the utilities **setup**, **antenna**, **rtdisp**, **bitex** and

zauto. This font exposes a bug in RHEL5 in the OpenMotif shipped by Red Hat. This bug causes some of the text strings in GUIs to display blank. If upgrading or installing 8.12.9 on an RHEL5.* system, you will need to install these rpms to patch OpenMotif:

```
openmotif–2.3.1–5.el5_5.1.0.test.00427438.i386.rpm
openmotif–devel–2.3.1–5.el5_5.1.0.test.00427438.i386.rpm
```

These are supplied on our installation media in the RHEL5/extras/RPMS directory, and are also available on our ftp site. To install:

```
# rpm –Uhv openmotif–*
```

Also, if you are upgrading from a previously installed IRIS system, you need to edit your /etc/sysconfig/i18n file. It should read similar to the following:

```
LANG=”en_US.UTF–8”
SYSFONT=”latarcyrheb–sun16”
```

7. The IRIS daemons are now run with root privilege. This means that you cannot start IRIS using the shell command **siris** when logged in as operator or radarop. Instead you should use the service command, which needs root privilege, for example:

```
$ su –
# service iris start
```

or

```
$ sudo /sbin/service iris start
```

This requires that you make changes to your /etc/sudoers file, as follows:

Uncomment the line:

```
#Cmnd_Alias SERVICES = /sbin/service, /sbin/chkconfig
```

Add a line at the end for radarop (and for operator, if your system has a login operator account):

```
operator ALL=(ALL) NOPASSWD: SERVICES
radarop  ALL=(ALL) NOPASSWD: SERVICES
```

You need to use the program “visudo” to edit the sudoers file.

8. *RHEL6 sytems only:* RHEL6 is now stricter about RPC (remote procedure calls). If you install the OS without using our **sigconfig** script, you will get the error message from the IRIS_SERVER process “Cannot register service: RPC: Authentication error”. To fix this, please enter the following commands:

```
# echo “RPCBIND_ARGS=i” > /etc/sysconfig/rpcbind
# service rcpbind restart
```

9. If you are upgrading a system with IRIS WebView installed, we have changed the name of the daemon starting script from “tomcat” to “tomcat6”. You should delete the old file with:

```
# chkconfig ––del tomcat
# rm /etc/init.d/tomcat
```

Vaisala RPM Naming conventions

1. There are now almost 50 rpm files supplied on the IRIS release media, in addition to the IRIS and RDA code itself. A typical file has a name like:

   `dkms-kvasercan-4.75.1-5.vel6.i686.rpm`

   In this name, the second from the last string ("vel6" in this case) indicates that this was built for Enterprise Linux Version 6. The "v" indicates that it was packaged into an rpm format by Vaisala. If it just has an "el6", then probably it was packaged by Red Hat.

New Features

1. We now support internationalization of some of the IRIS menus, and some of the IRIS utilities. This means that customers can modify their systems to display these GUIs in their local language. Currently we are shipping Russian language files only, and the default language is English. The menus supporting internationalization in IRIS are those required to run a radar and make raw products: Main menubar, Radar Status, Archive, Automatic Mode Switching, Product Output, Ingest Summary, Message Menu, Product Configuration just for RAW products, Product Scheduler, Task Configuration, TSC Editor, and TSC Monitor. Utilities supporting internationalization are: **setup**, **antenna**, **rtdisp**, **bitex** and **zauto**. Also the error messages stored in IRIS_ERROR.LOG are internationalized. IRIS–118

   To set your language for your whole system, edit your /etc/sysconfig/i18n file. If you wish to set languages separately for each of your users, you should put the same information in a ~/.i18n file for each user who is different from the system language.

   If you wish to modify the Russian language strings used in IRIS, see the new write-up in the *IRIS Programmer's Manual*, chapter 1.

2. IRIS product outputs in TIFF format now are supplied in **GeoTIFF** format. This is a backwards compatible format which is viewable by all TIFF viewers, but also contains geographical specification meta-data. To produce such an output, configure a network output in **setup**. Specify the file format to be TIFF. With such outputs, the image size is controlled by the Width and Height fields in **setup**. To view a dump of the geographic meta-data, run the program **listgeo** on the file. IRIS–23

3. Created a new pipe called **Dwr2ToIris**. This converts the Indian BEL DWR Mark 2 format to IRIS RAW products. We supply a dump program called **dwr2_view**. This format supports configurations which are stored as hybrid volume scans in IRIS, so sometimes the pipe will produce multiple outputs for one input. IRIS–107, 109, 233

4. We have increased the maximum number of color scales which can be defined for any single data type from 8 to 32. This has an impact on **color_setup**, as well as the Color Scale Tools in the Product Output Menu, the Quick-Look Window, and the real-time display. IRIS–89

5. Thanks to Metstar (who contributed their code in an open source collaboration) we now have a vertical grid and labels on the MAX product side panels. We also fixed the unit

label in legend for the height of the side panel. It was fixed as “km” even when the units were changed to nautical miles and kilofeet. IRIS–282

Bug Repairs

1. The IRIS cross section tool had a bug in release 8.12.8. It did not handle data correctly when the input task was hybrid. It was getting data from just one task. IRIS–261
2. Many changes were made to **zdrcal** to improve usability. If IRIS is running the radar radiate in automatic mode, then **zdrcal** will turn the radiate on and wait for it to start before running. It will signal a warning if the radiate is not on. Fixed a bug which was causing the “zdrcal –update” and “suncal –update” changes to not take effect until IRIS was restarted. RhoHV is now calculated consistently with the RDA setting of the POLFLAG_CNOISECOV flag. This controls how noise is compensated for in RhoHV. Echo returns are consistently treated as SNR. Stores the vertical channel noise in addition to the horizontal noise in the results file. Fills in more meta-data in the IRIS task configuration structures in stored data. Specifically the extended headers, transmitter phase sequence, RVP ray header configuration bits, time series flags, receiver bandwidth, dual-pol attenuation correction flags, and melting height. IRIS–97
3. Fixed a bug in the new **IrisToOdimHdf5** pipe. Not all the attribute strings were stored with the trailing NULL. Lengths should be strlen()+1. IRIS–101
4. Improved the logging in **N2RelayOut**. It was not possible to turn on logging to a file, and it was not possible to turn on verbose logging. It now defaults to logging to the file, and takes a final optional command line argument of “–verbose” to turn on verbose logging. IRIS–250
5. The **rays** utility was not correctly parsing the command line option “–sweep=”.
6. As mentioned in the 8.12.6 release notes, we made a change in the command line syntax for IRIS input pipes. If you wish to run an IRIS input pipe from version 8.12.6 or later on an older system, you can now do this with the new script **pre_8.12.6_wrap**. Instructions are in the comments in the script, which is in the pipes directory. IRIS–106
7. As mentioned in the 8.12.8 release notes, we made a change in the command line syntax for IRIS output pipes. If you wish to run an IRIS output pipe from version 8.12.8 or later on an older system, you can now do this with the new script **pre_8.12.8_wrap**. Instructions are in the comments in the script, which is in the pipes directory. IRIS–151.
8. IRIS was signaling the error message “Number of output bins does not match task configuration” incorrectly. This happened if you asked for a task with no data types turned on. We now signal a more informative message. IRIS–291
9. Fixed a bug in the **zauto** calibration program. It had a feature which allowed the operator to copy a fresh calibration from one pulse width to another. It was not calculating the correct calibration differences. Because the calibration is dependent on both the noise level and the I0 it is not easy to correctly guess what changes to make at other pulse widths. So we removed that feature. IRIS–302

10. Removed the color scale section from all the IRIS product configuration menus. This feature has not been used for a while, since products are data, not colors. IRIS–318

11. Fixed some memory leaks in the product generator, particularly in the CAPPI product. Some dating back to [25151] in release 8.12.7. IRIS–328

IRIS 8.12.8 Release Notes (10 February 2011)

These notes cover changes made in IRIS since release 8.12.7 of 19 October 2010. If you are upgrading from an earlier release, please read those notes also. Revised to svn [25730]

Installation/Upgrade Changes

1. There are now new Vaisala supplied OS Install Disks available for RHEL5.4 and 5.5. These are dated 19 January 2011. If you are installing using our disk, be sure to get a new one. IRIS–69, IRIS–71

2. The install media has grown a lot. If you are downloading the iso file to burn locally, you will need to burn it on a DVD not a CDROM. IRIS–105

3. ***IRIS WebView*** *users only:* The Linux installation procedure has been modified to install support files needed for **IRIS WebView**. If you are doing a new Linux install please follow the version 8.12.8 manual, and you can skip this. If you are installing **IRIS WebView** on an existing IRIS system, you will need to install some things manually, which would otherwise be automatic. Please do this before the instructions in the *Software Installation Manual*, Appendix F.

   You need to remove the old tomcat5 which is probably installed on your system. First turn this off with:

   ```
   # service tomcat stop
   ```

   Next delete it all with the command:

   ```
   # rpm –e tomcat5
   ```

   There are some other tomcat5 related packages which you can leave on your system.

   You need to install postgresql. You can get this from your RHEL5.4 installation disk:

   ```
   # cd /mnt/cdrom/Client
   # rpm –Uhv postgresql–8.1.11*
   # cd /mnt/cdrom/Workstation
   # rpm –Uhv postgresql–server–8.1.11*
   ```

   You will also need to copy the tomcat6 init script:

   ```
   # cd /usr/sigmet/config_template/rc.d
   # cp tomcat /etc/rc.d/init.d
   ```

4. ***IRIS 3DView*** *users only:* The Linux installation procedure has been modified to install support files needed for **IRIS 3DView**. If you are doing a new Linux install please follow the version 8.12.8 manual, and you can skip this. If you are installing **IRIS 3DView** on an existing IRIS system, you will need to install some things manually, which would otherwise be automatic. Please do this before the installation instructions in the *IRIS Product and Display Manual*, Appendix D. You need to install mesa–libOSMesa. You can get this from your RHEL5.4 installation disk:

```
# cd /mnt/cdrom/Client
# rpm –Uhv mesa–libOSMesa–*
```

5. We have changed the command line syntax used when calling IRIS output pipes. When upgrading to 8.12.8 or later, you will need to install new versions of all your pipes. If you have written your own pipe, you will need to revise it. The change is that we now supply arguments of the form: "—option=value", previously the syntax was "–option:value". If you use any of the following pipes, you will need to upgrade to the newest version: **IrisToArchive2**, **IrisToHDF5**, **IrisToMcidas**, **IrisToNetCDF**, or **VilToVir**. Note that if you wish to run a newer output pipe on an older system, please see the *IRIS 8.12.9 Release Notes*, Bug Repairs 7. #1000

6. We have changed the recommended HydroClass recommended configuration, stored in the files dpolapp_*–band.conf files. After upgrading, please run "dpolapp –generate" to generate new files. You will need to replace any customization you have done.

New Features

1. An exciting new feature is our **IRIS 3DView** program. This allows the user to interactively view and rotate the IRIS radar data in 3D. This is a separately licensed product. Please see our web site for the product brochure, as well as viewing the new Appendix E of the *IRIS Product and Display Manual*. The old IRIS/3D is removed and no longer available. #1690

   Just a couple of possible problems to watch for when installing **IRIS 3DView**:

   - It needs a non-root user to run under, when installing standalone (without IRIS) the installation instructions suggest you create the user "radarop", rather than the historical "operator".
   - If installing after using the Vaisala provided install disk, you will be in text-login mode. To switch to graphical mode, you need to edit the /etc/inittab file and change the first significant line to read:

     ```
     id:5:initdefault
     ```

     then type "telinit 5".

2. Another new feature is our **IRIS WebView**. This is a complete rewrite of our old IRIS/Web feature, which is no longer available. Please see our web site for the product brochure. #1705 Here is a problem to watch out for when installing **IRIS WebView**:

   - It will not be able to display any radar data without valid geoserver map data. We do not yet have sample data or instructions for how to install this. The Vaisala service personnel with do that.

3. The new **IrisToOdimHdf5** pipe is now available. This is used to convert IRIS products into the EUMETNET OPERA HDF5 format, version 2.0. If you wish to install this on an older version of IRIS, please contact Vaisala for instructions. #1471

Bug Repairs

1. Fixed the NDOP product which was crashing with a segmentation error. This bug started on release 8.12.6. This is also fixed in patch release 8.12.7.1. #1696

2. Fixed a bug in IRIS causing the error message "Attempt to run unlicensed feature <hydroclass at reingest>" even on single-polarization radars which were not trying to make hydroclass. This bug is also fixed in patch release 8.12.7.1. #1693

3. IRIS's simulated data now will simulate Tv data. It is just a copy of Th. #911

4. Fixed a bug when first starting **UalfRelayIn**. It was printing an error message "Invalid argument to mpj_pin_region". #1678

5. We removed the default K–R numbers from **setup** since they were not used anywhere. #1684

6. The IRIS **install** GUI program was modified to remove the "Headers", "Objects", and "Source" buttons. These packages are now installed whenever you install IRIS or RDA. This was done to solve consistency problems caused when customers installed them once, then upgraded without upgrading these files. This has the side effect that you must now also download the headers.tgz, objects.tgz, and source.tgz files when doing a network install.

7. The **UfToIris** pipe logging to the log file is broken in 8.12.7 and 8.12.6. It was not writing to the log file, and it was also writing alternate blank lines in the terminal log. This bug was introduced when switching to the siglog logging. #1703

8. Another bug fixed in the **UfToIris** pipe: Since the user could specify what data size to store for each data type, it was possible to configure for a mixture of 8- and 16-bit data. This is not supported in IRIS currently. We now detect and signal this case. #1706

9. In the **IrisToUf** pipe, if the UF ray size exceeded 20,000 bytes, then the pipe would often crash with a segmentation error, or other strange errors. There is still a maximum at 40,000 bytes/ray. This bug has been in the pipe since it was created, we are more likely to reach this size with dual-pol data types and more range bins. IRIS–117

10. Made improvements to the VVP product related to thresholding on weak signals. We have always calculated valid values independently for each data type recorded. The QLW and **productx** were not checking those valid flags. This is now done, and the data format documentation is updated to explain this. We also have forced a moment to invalid if either the moment value, or standard deviation is invalid. The QLW display-time thresholding is now computed separately for each moment. The QLW standard deviation bars are now shown, even if the mean value is off screen. #1707

11. The **RainbowToIris** pipe is enhanced to read in latitudes and longitudes in a not-quite-decimal format of DDD.MMSSss. Where "DDD"=degrees, "." is decimal point; "MM" is 2-digit minutes, "SS" is 2-digit seconds, and "ss" is more digits of decimal seconds if any. This was required for some data from Korea. #1714

12. There were many problems with the hybrid sub-task field in the QLW Live menu. These are now repaired. When you change the field, a new product is generated, and when you change tasks, the sub-task field is updated with wild cards, if applicable. #1723

13. **Productx** was not displaying the last range bin if you made the line length long enough to get all the range bins.

IRIS 8.12.7 Release Notes (19 Oct 2010)

These notes cover changes made in IRIS since release 8.12.6 of 2 July 2010. If you are upgrading from an earlier release, please read those notes also. Revised to svn [25151]

New Features

1. Renamed the **AntLog** utility to **AntLogger**, and removed the "ln –s ps_iris IRIS" symbolic link in the /usr/sigmet/bin directory.

2. Reorganized the IRIS and RDA source tree to separate into 3 parts: IRIS, RDA, and base code used by both. We have removed the top level libs and utils directories. #313

3. Removed utilities **agcal**, **gaincal**, **gaintest**, **stcwave**, **trigger** and **zauto6** from the release. These were all used only for the **RVP6**. We are dropping all support for the **RVP6** from IRIS.

4. We now support recording the horizontal SNR, and vertical T and Z data moments in IRIS and in **ascope**. We have added a **setup** question in setup/DSP to enable/disable the SNR. This will allow customers to hide SNR if they do not want to see it. The vertical T and Z data is still thresholded by the horizontal channel. #1395, #1487 #1488

5. To better support the new IRIS **Webview** display we now separately configure the display's output options in the IRIS Product output menu. There is minimal configuration, just for options not specified in the IRIS Webview. That includes the product specific display options for VVP, WIND, etc. The color scales used with be those configured for default in the **color_setup** utility. Overlays and range rings are forced off in the server, these are added by the Webview code. Previously we were using the output options of the first output device. #989

6. **Zauto** now has a new command line option "–burst_pwr". This is used to optionally record the burst pulse power. This is needed for automatic/unattended mode when the actual power is not measured. #652

7. When configuring manual tasks in IRIS, you can now specify the total dwell time either in time or in rays. Both are displayed. The maximum of 1024 rays still applies. #939

8. The IRIS COMP product now has a new feature called "late composite regenerate". If one of the inputs to a composite product currently in the schedule arrives, and the composite was already made, then IRIS will regenerate the product. This is limited to the most recent composite, and is enabled via a button in the product configuration menu. #778

9. We have removed the "Inherited Scale" feature from IRIS, and so have removed the button from the Color Scale Tool in IRIS POM and QLW menus. You now need to specify the color scale at display time. #1524

10. We have added a feature to **HydroClass** to figure out it the data for a particular range bin is from convective or stratiform rain. It uses information from higher sweeps in the same

volume scan. It is called the "cell classifier", and needs to wait for the entire volume scan to complete before it can be calculated correctly. #908

11. We have added the CSU adaptive-smoother KDP algorithm to IRIS and the RVP900/RVP8. This is still not handling clutter biased data correctly. #956

12. Enhanced the IRIS CAPPI product to handle hybrid input data where the range span of the input sweeps are not the same. The start range, range step, and the number of bins can vary. At each horizontal range, we interpolate only between those elevation angles which have data at that range. This also applies to volume scans with repeated elevation angles with different range spans. This is particularly important for long compressed pulse radars, because they can use a shorted pulse at higher elevation angles. #1605

13. The new QPE algorithms are now working on the SRI product. If the input data is anything other than just Z or T, the reflectivity profile feature is not used. This also fixed the live tool, which was crashing on the SRI product. #1486 #1490

Bug Repairs

1. The **HDF4ToIris** pipe was getting an error message even when it worked fine, but only if the verbose logging was turned off. #986.

2. Fix bugs in the new **KnmiHDF5ToIris** satellite input pipe. It was writing to the wrong log file "HDF5ToIris.log". It was setting the projection incorrectly. The image was rotated 90 degrees so North was to the left. The product names were all the same, so we did not get all the images from the file. Also added default region corners for those files which have invalid corners in the file. #933

3. Fixed a funny bug in the interactive XSECT. If you moved both line end points to the same pixel, it was not possible to pull them apart again. #1531

4. Turning on Vc data with 16-bit data did not work, and caused a bad error message. #1003

5. Fixed a bug in IRIS's sweep number setting feature in Ingest. If you are running a single task continuously, it was not setting sweep number 1 after the first run. So, for example, you might get sweeps 1, 2, 3, 4, 4, 2, 3, 4, 4, 2, 3, 4 ... This was particularly visible when recording time series. #1319

6. Fixed a long standing bug in the **bitex** meteogram vertical axis label. If the the "Warning Flag" was configured "Low" in the Status Field Configuration Menu, then we would swap the vertical axis label in the meteogram plot. #1603

7. In the task configuration menu, the threshold control flags for W and ZDR could not be changed. #1629

8. Fixed manual scans with Vc. #1664

9. In the VIL product, the smoother would sometimes produce the wrong results when the data saturated at the maximum possible value. #1680

10. When the VIL product is computing VIR (vertically integrated reflectivity) it was generating height times the log of the linearly averaged reflectivity. This is not correct, it now produces the log of the height times the averaged reflectivity. #1681

IRIS 8.12.6 Release Notes (2 July 2010)

These notes cover changes made in IRIS since release 8.12.5 of 26 February 2010. If you are upgrading from an earlier release, please read those notes also. Revised to svn [24656]

Installation/Upgrade Changes

1. After upgrading, please remove you old dpolatten.conf file and install the new dualpol.conf file from the config_template directory. If you made customizations, you will need to manually make them again. #956

2. The command line format for all our IRIS input pipes was changed. This means that after upgrading, you will need to upgrade all your pipes to the current version. Do this by copying them from you /usr/sigmet/config_template/pipes directory to your /usr/sigmet/config/pipes directory. We have switched to the UNIX convention of "program —option=value", from the old format of "program –option:value". If you wish to run a newer input pipe on a pre-8.12.6 system, please see the *IRIS 8.12.9 Release Notes*, Bug Repairs 6. #1000.

New Features

1. The cross-section product will now use as input 3D CAPPIs as well as RAW polar. In the interactive XSECT Tool, the choice of input is made by the following alogorithm: If the base product is a 3D CAPPI, and (either the data is composited, or the ingest data is not available) then make the XSECT from 3D CAPPI; else use the RAW polar data as in the legacy algorithm. Note that for XSECT from CAPPI, you have no control of the data type. You get the same data as the input.

   In the product configuration menu, we added a switch which tells which style to do. In the legacy case, you specify the input task name, otherwise you specify the input CAPPI name. It will trigger a run-time error if the specified input CAPPI ends up being 2D. This also shows up in the Live Tool. We added a flag bit to the cross_psi_struct to select the style. The other configuration numbers will remain with a similar meaning. The X and Y offsets are still distances from the radar location in cm., and the angle is the orientation angle relative to the Y axis of the CAPPI. These distances and angle are in the grid space of the input product. To get a reasonable result, you should turn off the CAPPI fill feature in your 3D CAPPIs, and use a high resolution in the vertical axis, say at least 20 slices. While we were in modifying it, we got cross section of HydroClass data working in both modes. #776

2. We have significantly changed the way rainfall rate "R" is calculated on an IRIS system. Previously we supported just an R(Z) and an R(KDP) algorithm. We now support those, as well as R(KDP,ZDR), R(Z,ZDR) as well as NSSL algorithms which combine several equations. This has forced a reconfiguration of our software to add support for functions of several data moments. Also, it has forced a change to the product configuration menu. You now select the data type "R" in the data selector. After doing that, a new field is sensitized in which you can select which algorithm to run. If at run time, one of the

required data types is not available, you will get an error message. Configuring the coefficients for these various algorithms is made in the qpe.conf file. Note that the new QPE features are not working yet in the SRI product. You can only use R(Z) in SRI in this release. #923

3. We have enhanced the **HydroClass** data type quite a bit. It now can compute several different classifiers and store them in the RAW data file. At product generation time, you can now select which classifier to view. Added to the Product Configuration Menu in the DISPLAY PARAMETERS section is the new selection for Classifiers. Classifiers are only displayed when a data type of HClass is selected in Data:Display. Classifiers will replace the Display Units label and text field. We recommend that you upgrade your dpolapp.conf config file with the command "dpolapp –resave" after upgrading the software. #1091

   Current classifiers are:

   Meteo — The legacy classifier, which classifies by type of metrological particle it is (rain, snow, hail, etc.).

   Rain — Classifies based on what type of rain we have, for example light rain, medium rain, heavy rain, or large drops. #941

   Cell — Classifies based on what type of rain cell we have, for example: Convective or Stratiform. It uses an algorithm similar to dBZ > threshold above the melting level. #908

   To display these correctly, you need to use a different color scale for each classifier. The template setup_color2.conf file has been changed to add example scales for these cases. After upgrading, you should consider replacing your file.

4. In IRIS, the Task Configuration Menu is enhanced to support the new PMI threshold in the RVP. PMI is short for "Polarimetric Meteorological Index". It is a number between 0 and 1, in which 0 means the signal is probably not Meteorological, and 1 means it is. The PMI threshold is only available on Dual-Pol systems, with Proc Mode = PPP, and (Polarization = H+V). This PMI value can be used to filter out sea clutter, for example. #1010

5. IRIS now supports display and recording of Tv and Zv, that is the vertical reflectivity in addition to the horizontal reflectivity. These are available in **ascope** and IRIS ingest.

6. Added a new pipe to read in HDF5 Satellite images for Turkey. Pipe is called **KnmiHDF5ToIris** because the format is similar to a published KNMI format. The source for this is public, in directory src/utils/hdf5. #933.

7. The **HDF4ToIris** pipe was improved to allow sub-regions of the whole screen to be selected for conversion to IRIS. This is needed only if the product size is larger than 3100x3100. That is the current largest product dimensions supported in IRIS. #986

8. The IRIS log file now contains information messages indicating whenever the system goes from OK to Fault or to Critical state. These informational messages do not generate pop-up messages in the GUI viewers, but the messages are visible in the log file. This allows searching the file to see when our radar has faulted. #185 #917

9. Adding a new utility called **show_availability**. This program will read the IRIS log file to determine the percentage of time the radar was working correctly. IRIS can either be turned off, running OK, in FAULT state, or in CRITICAL state. To take full advantage of this, you should increase the time that log information is preserved by modifying your logrotate config files. #917

10. The KDP calculations in IRIS Reingest were changed to implement the CSU (Colorado State University) algorithm. Configuration is via the dualpol.conf file. #956

11. We have added a new utility program to IRIS called **color_file_dump**. This program converts the IRIS setup_color2.conf file into a fairly simple .ini style format. It is used manually to create a color scale definition file for use by the new IRIS/3D application. #1090

12. Many changes were made to the socket server to support the new IRIS/Web client program. These include:

    Added a bounding box to WIN_LOAD options. To specify a bounding box the string would be “bbox=lon0,lat0,lon1,lat1”. Where lon0/lat0 would be the lower left corner and lon1/lat1 would be the upper right corner. This is the same syntax as a WMS request. Also had to change the separator used for making socket server requests. The old separator “,” is changed to “&”. Again this is the same syntax as a WMS request.

    Added new options to the POM TIMELIST command: endtime and timespan. #988

    Added a new option to command POM TYPELIST. Option is georef=true/false. If set true then return all georeferenced product types. If set false then return all non georeferenced product types. If param is not passed to socket server then return all georef and non-georef product types. #1055

    There was a bug with png filenaming used by the WinLoad function. We create a png file (/tmp/sserverWinLoad.png). The problem was that at high speed, with multiple processes creating files simultaneously, we needed a unique name for each process executing the Win-Load function. The fix was to append the pid of the process to the end of the filename (/tmp/sserverWinLoad1234.png).

    Added to metadata the bounding box when doing a WIN_LOAD. Returned param in meta-data is bbox=lon0|lat0|lon1|lat1. #1290

Bug Repairs

1. Fixed a bug in IRIS/Radar in active ingest mode: It was getting the “Problem starting scan at EL=0 (EL Position not reached)” errors frequently even though the antenna was responding correctly. It was also not waiting for the appropriate settling time. Other similar errors possible. It would only happen at the start of tasks, not between sweeps. This bug was introduced in 8.12.5, and there is a patch on our ftp site for it. #1363

2. Fixed a bug introduced in 8.12.5, which was causing the real-time display to show the wrong elevation angle. In some cases 1.5 degrees low. There is a patch on our ftp site for this bug in 8.12.5. #1022

3. Fixed a bug in the IRIS QLW. If you exitted the Live Menu using menubar “x”, it would leave the scroll bars on the window. #936

4. Fixed a longstanding bug in all the QLW popup tool menus. They did not exit correctly when you pressed the “x” button in the titlebar. #1036

5. When playing back time series, there are a number of possible data mismatch errors. These error messages were broken since 8.12.1, and only numbers were reported to the user. #1033

6. The new extended legend introduced in release 8.12.5 was showing the wrong Min/Max values height data (BASE, TOPS, etc.) and 16 bit data. Also it had incorrect values for the resolution of non-georeferenced data. The resolution is now correct for XSECT, BEAM, RTI, RHI. It is the horizontal resolution. #1038

7. Years ago we put a feature in our overlay drawing to not fill small regions, such as small rivers, if the feature was not at least 3x3 pixels. This was to prevent filling leaks when the fill points move over the boundary lines. We have added a flag to the overlay files to enable small fill regions. #1058.

8. RHI scan geometry is now allowed in TS playback passive mode. #1092

9. The **IrisToNetCDF** pipe was labeling the output range spacing units as kilometers, when it actually was meters. #1122

10. Fixed a bug in the QLW Live mode. When QLM is first popped up, LIVE is selected, then a taskname is selected: it would not produce a product. #1174

11. Raised the maximum number of centroids in a WARN product from 300 to 600. #1212

12. Raised the upper limit allowed for the radar height above the ground from 1000 to 2000 meters. #1227

13. Fixed the XSect Tool to display for selection the data types from the ingest data file that the product was made from. This includes HydroClass, which previous was missing. #1175

14. IRIS ingest would crash in passive mode if it tried to run an exec task. This is fixed, you can now run exec tasks in passive mode. #1255

15. The VIL and VIR products can both exceed the maximum value of about 300. In that case, strange values were produced. We now clip to the max value both in the product generation and in the smoother. #1288

16. There is a limit in IRIS of 200 Product Output Menu automatic send requests. Fixed a bug in which when you reach or exceed this limit, the IRIS server would crash when trying to save the POM. #1469

17. The RVP FIR filter width value is now filled in the ingest_header structure. Previously this value was zero.

IRIS 8.12.5 Release Notes (26 February 2010)

These notes cover changes made in IRIS since release 8.12.4 of 28 September 2009. If you are upgrading from an earlier release, please read those notes also. Revised to svn [23563]

Installation/Upgrade Changes

1. The release now requires the **lapack** and **blas** libraries from the RedHat installation media. These rpms will be automatically installed on a new OS install, using our new version 4 install disk, or following the new manual instructions in the *Software Installation Manual*. Be sure to get our new version 4 Installation disks if you use them. There are available for Redhat Enterprise Linux Desktop, releases 4, 5.0, 5.3, and 5.4. #1004

   However, if you are just upgrading IRIS on an existing system, you will need to install these manually. Here are instructions after you mount your Redhat Installation Disk:

   ```
   # cd /mnt/cdrom/client
   # rpm –Uhv blas–*.el5.i386.rpm
   # cd /mnt/cdrom/workstations
   # rpm –Uhv lapack–*.el5.i386.rpm
   ```

   If you do not have your original Redhat Installation Disks, do not panic. We have also placed these rpms on our ftp site at:

ftp://ftp.sigmet.vaisala.com/outgoing/os_patches/RHEL5/RPMS/blas–3.0–37.el5.i386.rpm
ftp://ftp.sigmet.vaisala.com/outgoing/os_patches/RHEL5/RPMS/lapack–3.0–37.el5.i386.rpm

   These should work for the family of RHEL5s: 5.1, 5.2, 5.3, 5.4. For RHEL4 we have placed the appropriate rpms in the RHEL4 directory.

   If you do not access to ftp, still do not panic. Starting at release 8.13.0 we have also placed these rpms (for RHEL5) on our release dvd and iso file in the extras/RPMS directory.

2. This release adds support for new data types to IRIS. If you are doing a new install, you will get our suggested default color scales in **color_setup** for these. However, if you are upgrading from an older code version you will need to initialize the default scales. If you are OK with erasing your private color scale customizations, you can copy over our setup_color2.conf file from the config_templates directory. If you want to keep your current state, then please run **color_setup** to initialize the new data scales. Do this by selecting each of the new data types one at a time: VIR, VILDen, Turb, Temp, and Albedo. For each of the new data types, press the "File–>Open Example" button. For Albedo only, select the gray scale color set, then save. You have to restart IRIS after this for it to take effect.

3. There are new versions of our "OS INSTALL DISC"s available, revision 4, dated approximately 26 February 2010. They are changed to install the lapack–devel rpm, which will allow compiling our code. They are available for RHEL Desktop 5.0, 5.3 and 5.4.

New Features

1. We have added many new data types to IRIS. This is to support satellite data, and other new requirements. Data types added were:

   - Zv (Reflectivity in the vertical polarization in dBZ)
   - Tv (Total power in the vertical polarization in dBT)
   - VIL Density (in g/m**3)
   - VIR (Vertically Integrated Reflectivity in dBZ-km)
   - Albedo (in percent)
   - SNR (in dB)
   - Temperature (in degrees C)
   - Turbulence (in $cmE^{(2/3)}/s$)

   5 of these data types show up in **color_setup** and in the Color Scale Tools: VIR, VIL Density, Albedo, Temperature, and Turbulence. The Zv, Tv, and SNR types will use the color scales defined for reflectivity. Note that as of this release, IRIS only produces 3 of these new types: VIL Density, Albedo, and Temperature. The other types are for future features, and for customers to use in their own products. #949 #921 #911 #774 #940 #987

2. We added a new LAYER product type. This stands for “layer average”, and is similar to the VIL product, in that it processes all data between two layers in the atmosphere. However it computes the average, rather than the integral over the layer. It can average any input data type, for example it can produce LAR (Layer Average Reflectivity). It can also average the liquid content, thus producing VIL Density. This product is supported in the live product menus. #773 #921.

3. We have enhanced the VIL product to now have the choice of computing either VIL (Vertically Integrated Liquid), or VIR (Vertically Integrated Reflectivity in dBZ-km). Because the LAYER product now computes Layer Average Reflectivity, this is removed from the VIL product. #967

4. We added a new SATELLITE product type. This is used to store imported satellite images. Previously these were stored as USER products. #949

5. There is a new pipe called **HDF4ToIris**. It is used to input satellite data for Korea from the MTSAT satellite. Data is expected in a particular HDF4 format. These files contain 1 visible Albedo channel, and 4 IR temperature channels. #774 #773

   If you wish to run the new **HDF4ToIris** pipe, you will need to install the hdf rpms. If you did a new installation, this is automatic. However for upgrade, please follow these instructions:

   Mount the IRIS/RDA release cdrom and look in the directory RHEL5/extras/RPMS. If you do not have a release cdrom, the same files are located on our ftp site:

ftp://ftp.sigmet.vaisala.com/outgoing/os_patches/RHEL5/RPMS.

Install with the following command:

```
# rpm –Uhv hdf–*.el5.i386.rpm
```

6. We added a new feature to the SHEAR products. In addition to the radial, azimuthal, and elevation shear, we now also can compute the NS and/or EW shear. This includes changes to the product configuration menus for CAPPI and SHEAR products, as well as the shear_psi_struct. #924

7. We added dual-polarization moments to the list of data types in the MAX product configuration dialog. #859

8. We have enhanced the **SIGNALS.DAT** file. It now supports the new action called "StdinExec". This new action means that IRIS will exec off the specified program, and it will pipe into it's standard input the error message text. This allows you, for example, to email the errors to someone. #932

9. We have added a new information legend panel in the QLW main window. This panel is only displayed when the window height is >= 720 pixels. The legend displays: Resolution, PRF, Max and Min data value and where they are located in Az and Range. #918

10. The COMP product is enhanced to add two new merging algorithm choices: NEAREST and WEIGHTED. #777

Bug Repairs

1. The IRIS Ingest-time clutter map feature was broken since svn [22601] in release 8.12.3. You get the error message "Clutter map angle resolution not match". #914

2. There was a bug in the way in which the **dsp library** controlled single polarization radars. You could get the "Processor misconfigured" error on single polarization systems. It assumed that the polarization was always correct, but if you saved a **RVP900** in dual receiver mode, then reconfigured it not to support dual pol, you will get this error. This was fixed by always setting the transmit polarization, even in single polarization systems.

   There is an easy work around for older systems: Set up both setup/RVP and dspx/mc to support dual-pol. Then run ascope and set the polarization to horizontal. Then save in dspx, then set both setup/RVP and dspx/mc back to signal pol. #959

3. In support of aircraft tail radars, we have changed the definition of the aircraft tail elevation angle. It is now zero when pointing out the starboard wing. This change was also made in the *IRIS Product & Display Manual*. #948

4. Many improvements made to the custom library used to read aircraft information on the NOAA G4 airplane. This includes setting the AAMPS arrival time in the correct place, and initializing the ARINC interface channel IDs.

5. Also for NOAA G4: on all aircraft tail radars, the **real-time display** will now correct the elevation angle for the roll of the airplane. This will tend to keep the ground returns on the bottom of the display. We are not correcting for the cosine of the azimuth angle, so the range of the ground return will appear at a larger range than expected for radars which do not scan perpendicular to the plane. #973

6. Fixed a segmentation violation in the **IrisToUf** pipe. It was crashing if the input file contained more than one data type. This bug was introduced in svn [23111] in release 8.12.4. #906

7. We added support in the **IrisToArchive2** pipe program to separately specify the byte order of a few fields. This was requested by Hong Kong. We already had control of byte order for the whole file either way. #913

8. The I**risToBufr** pipe failed with a segmentation violation on a completely blank input if AUTO_PRECISION flag is turned on. #960

9. When using DPRT-2 mode, it required a much higher instantaneous PRF from the average PRF. The DSP library was faulting on this case. We changed the fault to be not fatal. #963

10. Fixed HClass in **color_setup**. Removed updating right text field, it was doing very strange things when you clicked on different colors. #968

11. Almost all of the product configuration menus contain product smoothing values. These were not range limited, and it was possible to enter negative values. These are now fixed so that all horizontal range filters limited to values between 0 to 100 km. Vertical range filters (XSECT, RHI) 0 to 10 km. Shear azimuthal filter, and BEAM filters range 0 to 90 degrees. Note that the actual filters have a maximum value usually much lower than that. #971

12. The SHEAR product has a feature called the VCT (Velocity Clutter Threshold). This is an attempt to remove biases due to clutter contamination. It will threshold away velocity numbers very close to zero. It is tuned to the shear smoother length, so that the smoother will fill in all the thresholded data. There was a bug, and it was thresholding too many points. This is now fixed. #972

13. Fixed error messages in the product configuration menu. If you tried to delete the DEFAULT configuration file, the popup would say: “Product Configuration DELETE was not deleted”. Similarly, if a product was scheduled and you tried to delete it, you would get an error “Product Configuration DELETE was scheduled and not deleted” #984

14. The IRIS user cursor tool is fixed to better show values for our TOPS and BASE products. When the cursors is over a pixel with unknown value, it will now show “??.? km” instead of “23.5 km”. #901

15. In **bitex**, it was not possible to set an alarm threshold higher than +/–1000. This is raised to +/–10000.

16. The Logo in the IRIS menu image is switched to Vaisala from Sigmet. #931

IRIS 8.12.4 Release Notes (28 September 2009)

These notes cover changes made in IRIS since release 8.12.3 of 26 June 2009. If you are upgrading from an earlier release, please read those notes also. Revised to svn [23088]

New Features

1. Added a new display feature called “color highlight”. This is an interactive GUI feature which allows the user to easily see if a particular data range is visible on a display. This is done by changing one color range to a contrasting value. We have a new Highlight Tool popup launched from the Color Tool in the Quick-Look Window. In the Highlight Tool, you select the color cell to change, and the color to display it as. #858
2. We have added a new VAD product. This is the traditional Velocity Azimuth Display. In the product configuration, you select a range interval of data to average. It will average over this range for all elevation angles. Display can be a single plot, or a plot for every elevation angles. Because of the display options, there is a new VAD display options menu. Please see the manuals for details. #576
3. We have added a new THICK product. This is cloud thickness. It is the height difference between the echo tops and echo base products. There is a configuration options to select “pseudo thickness”. If this is enabled, then we fill in areas in which the top or bottom elevation sweep is above the threshold with the top or bottom PPI height, otherwise set it to “unknown”. To better support THICK and BASE products, we have changed the default installed height color scale to start from 0 km instead of from 2 km. A future feature not yet implemented is to include average reflectivity in the same file. #577
4. We have added support for making COMP and DWELL from MAX products. If the product has any side panels, they will be stripped from the product before the composite is made. Only the horizontal projection data is composited. #779
5. We added a new feature to the VVP product. You can now select a minimum velocity. All velocities below this number will not be included in the VVP fit. The intent is to remove bias due to a small number of poorly filtered clutter bins in the data. This involved adding a “Min Velocity” box in the VVP’s Product Configuration Menu. For this button to work, both the the menu client and the IRIS server must be version 8.12.4 or later. Previously the minimum velocity was hard coded as 0.02 times the Nyquist velocity. #872

Bug Repairs

1. In the **IrisToBufr** pipe, the line numbers are supposed to be origin 1, but they were origin 0. This does not effect the reverse **BufrToIris** pipes because it ignores the line numbers. #860
2. Fixed a bug in the IRIS **reingest** feature. If you reingested a single sweep product it would set the isweep_count meta data value to 2N–1 rather than to N sweeps. This

would cause problems later when converting the data to other formats like archive2. #863

3. Creating new input pipe for ROKAF Satellites called **GeostaSatToIris**. This is a general purpose satellite pipe which reads a file containing just 1 byte or 2 bytes per pixel and no meta data. The time is determined by parsing the filename, and the geo location information is from a config file. It also supports several different frequency channels and writes them to different product names. #774

4. The Data set popup of the Task Configuration Menu did not work the first time you open the menu. Fixed by making the TCF Menu 5 pixels bigger. #865

5. HydroClass was filling up the log file with repeats of "HydroClass: dpolapp_C–band.conf retrieve and configuration update ok". #868

6. The **IrisToArchive2** pipe was crashing if you fed it a bad input file. We added error messages for more fault conditions. #870

7. In the TSC editor menu, you would get an error message if you saved the file using a lower case file name. #719

8. The Malibu extended header plugin was modified to allow up to 5 ARINC channels, up from 2.

9. Fixed a bug in **bitex**. When adding a new sub panel button to a bitex panel you would get the following error and **bitex** quits: "Error: XtCreateWidget? (null) requires non–NULL parent" #876

10. The **RainbowToIris** pipe was not correctly handling the case when a partial volume scan arrives, followed by data from another scan. It is supposed to convert the partial scan which has arrived. Instead it was converting it but not informing IRIS, so an extra file was left on disk. #877

11. The **IrisToArchive2** pipe is now enhanced to supports byte swapping and header skipping for Hong Kong. The **archive2view** program already had command line options to read such files. #883

12. Fixed a bug which happens on RHEL5.3 systems when the a flood warning is signalled from the CATCH product. It was overrunning a character string, and getting the error "imapclose/sync: Channel does not match initial allocation". This problem potentially could happen with any product which generates warnings, like WARN, TDWR, SLINE, and CATCH. #884

13. Another bug with the CATCH product. If there was a catchment which is outside the radar scanned area, it will get no rain but was generating a warning for extremely high rain. #893

14. The IRIS feature used to output an image to Goggle maps is enhanced to optionally support an animation loop. To switch from most recent image to animation, you need to set the environment variable GOOGLE_ANIMATION.

15. Fixed a bug in **zdrcal** introduced in the last 8.12.3 release. It was getting only one ray of data from each sweep. There is a patch for this in version 8.14.3 on our ftp site. #887

16. Fixed shell return value from **zdrcal**. Also it now reports the correct PRF, previously it was reporting the PRF of the previous task. #891

17. We fixed a bug in RAIN1 product generation. If the input products were rainrate made from KDP using a K/R relationship then the resulting RAIN1 product was wrong. We changed the product to integrate the rainrates, and not attempt to revert back to dBZ. #871

18. The recently added **IrisToNetCDF** pipe had the latitute and longitude values reversed.

19. Raised the maximum in **setup** for the number of products on an archive to 10 million from 200 thousand.

20. In the **IrisToBufr pipe** we have added user adjustable thresholding based on the standard deviation for the various VVP data parameters. This is important for quality control to eliminate bad values. #902

IRIS 8.12.3 Release Notes (26 June 2009)

These notes cover changes made in IRIS since release 8.12.2 of 5 March 2009. If you are upgrading from an earlier release, please read those notes also. Revised to svn [22608]

New Features

1. Added changes required to do **platform motion correction** to velocity on both a shipboard and an aircraft tail radar. The corrected velocities are fed out the real-time display always, independent of the button in the Task Configuration Menu. This included adding antenna status bits into the TS format.

   We have added a configuration question to **setup** in the RCP pop-up, in the *Radar Site and Antenna Placement* section: "Antenna Scan Geometry". It can be set to "Traditional" or "Aircraft Tail". This changes the meaning of the azimuth and elevation numbers, as well as the equations to correct for platform orientation and motion. See the Appendix C of the *IRIS Product & Display Manual* for details. #689

2. The **IrisToArchive2** output pipe can now combine hybrid volume scans into one output file. It will cache the outputs sent to it, and output one file when the last hybrid is sent to it. For this to work, it is necessary that the files are output in time order, if an unexpected file arrives, such as one from a different hybrid time, it will flush the cache and output what it has. If a duplicate file is sent, that is ignored. All non-hybrid files are sent out without caching, and will flush the cache. This is the default behavior, if you wish the legacy behavior of one output for each input, then set the flag OUTPUT_HYBRIDS_SEPARATE in the IrisToArchive2.conf file. To correctly handle the cases where no output file is produced requires changes to the IRIS daemons, so upgrading you daemon to version 8.12.3 is required. Other changes are:

   1) The filenames produced now follow an Archive2 style of RRRRYYMMDDH-HMMSS.NNN.a2, where RRRR is the 4-character nexrad radar ID, NNN is the nexrad file extension.

   2) As an option, we now support the 2005 build 7 format with "AR2V0001." as the prefix, and the radar ID added to the nexrad volume header.

   3) If you are allowing single sweep inputs to **IrisToArchive2** using the AL-LOW_SINGLE_SWEEP flag, then these files are also cached and combined into one output just as hybrid products are. #757

3. This release adds the new **spiral overlay** feature. This is used to ease the manual tracking of typhoons and hurricanes. The user can draw a logarithmic spiral on the radar display, using the track/annotate tool. The center point and spiral phase can be adjusted. The motion of these center points can be tracked, and the maximum rotational winds are calculated and displayed. #522

4. Added a new feature called "Storm Relative Velocity". It is a correction to radial velocities made by removing the average storm motion from V. These velocities with

respect to a storm instead of the radar sometimes give better circulation and divergent signatures, especially in fast moving storms. The technique in IRIS is to use a FCAST product to find the average motion of storms, then remove this vector from all V in range bins making a Vc. Changes are in:

1) The **setup** GUI. In the Ingest section you can turn this on/off in reingest, as well as configure the maximum position and time offset to the FCAST product.

2) **Task Configuration Menu**: There is a new button to turn this on/off at ingest time.

3) **Rays** and **productx** display if this correction was applied to the data.

There is a data format change to all IRIS products to copy the task_calib_info flag bits into the product header. This will allow users to see which corrections were applied to their data. #578

5. The dual-pol attenuation code now includes an improved algorithm called "Iterative DP constrained attenuation correction", or "IDPC" for short. Be sure to edit your dpolatten.conf file to use the new algorithm.

Bug Repairs

1. **Irisnet** now has a reasonable initial state after a new install with a background and new .conf file. #413
2. Fixed a bug in the **iris** menubar Tools–>Customize Server. The "Available Servers" button would only get a list of available server if the "Auto Update" toggle was selected. #690
3. In **setup**/dsp you can now select type "RVP900", and things will run. #550
4. **Bitex** was crashing if you had a zero length antlib.log file. This is actually somewhat likely to happen. If you turn the logging off, then logrotate rotates the log file, it will produce a zero-length file. #724
5. Improved **irisnet** by adding a ping check first before attempting the RPC connection to the remote IRIS system. The problem was when going thru a router to a missing machine, the RPC call hangs for a very long time. #725
6. Fixed a bug in **irisnet**. Saving "Number of polling processes" and "Time between updates" was broken since release 8.11.6. #685
7. The hot point for the bird.xbm pixmap was moved to the tail of bird. This is the correct place for displays of bird tracking, which are rotated about the hot point to aim in the direction of motion.
8. On some systems in **bitex**, pushing the middle button in a subwindow would cause the program to crash. #684
9. The maximum window size allowed in **bitex** was 900x900 pixels. This is now 1200x1024, and can be changed by the customer in the resource file. #798

10. We now ship a plausible initial configuration for **bitex** on a new installation. #803

11. We now ship a new default powerup image in display windows. On an upgrade, you will keep your own power-up image. If you wish to use the new one, please type the following commands:

```
$ cd /usr/sigmet/config_template/images
$ cp startup_images.gif ../../config/images
```

12. IRIS color displays now work again in 16-bit graphics mode. This was broken since we added support for 256 data colors. #344

13. In the **overlay** utility, in the add/delete tool, when you selected "add underlay" it added extra "D" and "P" characters to the center point. This caused the parsing to fail when you typed C/R. #805

14. Suppressed the error message which used to be printed the first time anyone runs the **iris** menubar program after a new installation: "ENOENT; No such file or directory </home/operator/.iris_serv_setup.conf>" #468

15. Fixed bugs in the **Archive2ToIris** pipe:

    1) If there is no adaptation data, and the radar wavelength was not overridden in the .conf file, we got a junk wavelength, and thus got junk velocities and widths. We now force a default value of 10 cm in.

    2) If the number of bins is not exactly 460 Z, and 920 Doppler, data was messed up in velocities and widths.

    3) The Gaseous attenuation was ignored.

    4) Comments improved in the .conf file for old format ARCHIVE2, which does not include the radar ID. #819

16. Fixed a bug in the **HDF5** pipes: The maximum value allowed for the /how/WMO attribute was 10000. However this number may be higher, so we raised the maximum value to 131071. #821

17. We now have a new kickstart install disk for RHEL5.3. This is available on our ftp site, or from Vaisala.

18. The COMP product will now composite spectrum width (W). #527

19. The **HydroClass** package is enhanced to use a different file for S-band vs. C-band. The old dpolapp.conf file will be converted to dpolapp_C–band.conf when used after upgrading. S-band will use dpolapp_S–band.conf. HydroClass will automatically select the correct file based on the wavelength at run time. We also now ship a default file for each.

20. The **IrisToBufr** pipe was using the wrong custom codes for the linear scale for Spectrum Width. It was using the code for velocity, which will confuse the recipient into thinking the data is velocity. #847

21. **Irisnet** and **rtdisp** both had a bug when they converted old format files after an upgrade. They were creating a file called /usr/sigmet/config/retired instead of a directory. #852

22. When **suncal** is used to calibrate the LDR offset, and you were making a ZDR BEAM product, it was correcting the data using the old LDR offset instead of the old ZDR offset. This caused the LDR offset to increment for each run. It worked correctly for LDR inputs. #856

23. When you requested data corrections to Vc or Zc in the task configuration menu, and the corrections could not be done (due to lack of required input data, for example), then IRIS was still making the Vc or Zc without the correction. The header would indicate the the correction was applied, even though it was not. #857

24. If you started **ascope** with polarization set to Horiz, then switched to H+V, then turned on ZDR it would not display it. This only happens on radars which can only transmit H+V. #861

25. IRIS reingest of single sweep RAW products was producing an ingest file with the sweep count set to 2N–1. This caused some code, like our spiral wind fitting to get an error. If you have any of these bad ingest files, they can be fixed by reingesting them again after you upgrade. #863

IRIS 8.12.2 Release Notes (5 March 2009)

These notes cover changes made in IRIS since release 8.12.1 of 21 October 2008. If you are upgrading from an earlier release, please read those notes also. Revised to svn [21763]

Installation/Upgrade Changes

1. *RHEL4 systems only:* After upgrading you may get an error such as:

   ```
   EINVAL; Invalid argument <shmget iris_products (52975876 bytes)>
   ```

   This is because the size of the product inventory in shared memory has grown a lot to support the increased number of radar sites. If you do not need it, you can lower the maximum products on disk to 60,000 in **setup**/general. Or you can raise the limit on your system by editing the /etc/sysctl.conf file and adding a line which reads, for example:

   ```
   kernel.shmmax = 100000000
   ```

   Then reboot for this to take effect. Starting in 8.12.3 we made 60000 the default value for new systems. #768

2. The **instiris** script (called by **install**) is changed to always install all the Vaisala supplied init scripts in the /etc/rc.d/init.d directory. Thus you will automatically get new versions of these files, and lose any customization you have done. Turning them on is still done by **chkconfig**, the *Software Installation Manual* and the **sigconfig** script are revised to match this. #571

Data Format Changes

1. Because of the changes to support up to 128 radar sites in IRIS, the IRIS menubar will not be able to connect with versions before 8.12.2, and vice versa.

New Features

1. We have added a new feature in the QLW Track Tool. It can now draw a spiral typhoon overlay line on the picture. The user can move and rotate the spiral to line up with a rain band from the storm. This is used for manually estimation of the cyclone location. The location can then be tracked over time. #522

2. Increased the number of IRIS sites from 31 to 128. This effects lots of pull down menus, the **setup** program, the client/server protocol, many pipe programs. The site mask for composite logging is still limited to 32. Note that the special ”next” output site in the product output menu, is moved to a tag specified at the left end of the table. The pom save file format was changed, but we will automatically read the old format. #528

3. There is a significant change made to our log files. Both **IRIS_ERROR.LOG** (written by IRIS) and **antlib.log** (written by antlib) have a new format which is syslog compatible (RFC3164). This means that each line is one line long and starts with a standardized

format date stamp and hostname. A big benefit of this is that you can now browse these log files using standard viewers such as **gnome–system–log**. We have also replaced the old custom log file rotation of these files with the standard logrotate scheme. Thus after upgrading you will have files installed in your /etc/logrotate.d directory for these files. You can modify these files to control how many days of logs are preserved, the default is 5 days of antlib.log and 5 weeks of IRIS_ERROR.LOG. #453

After upgrading, the system will automatically rename the old rotated log files to the syslog naming convention of adding a suffix of ".1", ".2", etc. The antlib.log files are also read by the bitex utility so it can plot time history pop-ups for individual data fields. The reader will handle both formats, so a mixture after the upgrade is fine.

4. Significant enhancements were made to the HDF5 pipes:

- We have added new dual-pol data types RhoHV, LDR, PhiDP, and KDP. ZDR was already supported. These are using the OPERA information model, WD_2008_03. The rest of the format conforms to the COST717 information model WDF_02_200204_1. #564
- We now support both 8-bit and 16-bit RAW HDF5 data formats. If the IRIS file is 16-bit, it will produce 16-bit HDF5, similarly if the HDF5 file is 16-bit, it will produce 16-bit IRIS. We do not support mixed resolutions. #564
- Switched to using standard HDF5 RPM library, #562. If you are using the HDF5 pipes, please install as follows:

  Mount the IRIS/RDA release cdrom and look in the directory RHEL5/extras/RPMS. For RHEL4, use the RHEL4 tree. If you do not have a release cdrom, you can get them from our ftp site: ftp://ftp.sigmet.com/outgoing/os_patches/RHEL5/RPMS. Install with the following command:

  ```
  # rpm –Uhv hdf5–*.el5.rf.i386.rpm
  ```

- The HDF5 pipes use our new siglog library and produce log files in syslog compatible format, #453.
- **HDF5ToIris** now works for RHI and XSECT products, #561.
- **HDF5ToIris** now aborts with an error on dataset read error, it used to get all zeros. This will happen if the dataset type is not supported in the pipe.
- **IrisToHDF5** now produces ".h5" style output names.
- Fixed the /how/angles attribute. We used to write /how/angles as an array of floats. Now we write /home/angles as an array of strings as specified in the information models. When reading /home/angles we can read /how/angles, we can handle either way for backwards compatibility. #644

  If you wish to install these HDF5 changes on an older system, you can download the new versions from our ftp site at:

  ftp://ftp.sigmet.com/outgoing/patches/8.12.1/RHEL5/IrisToHDF5–8.12.2I.gz
  ftp://ftp.sigmet.com/outgoing/patches/8.12.1/RHEL5/HDF5ToIris–8.12.2I.gz

5. We have added a new output pipe to convert IRIS RAW products into netCDF format. We support two netCDF3 naming schemas — one from Unidata and another from the Forecast Systems Laboratory(FSL). You can configure this in the IrisToNetCDF.conf file. #553.

   To use the new netCDF pipe, you will need to install the netcdf rpms. They are available on the release cdrom in the director, and from our ftp site.

6. The IRIS MAX product can now be run on input data types W, V, and Vc, #525.

7. We added a new **iris_client_shell** program to IRIS. This is a shell command which can send any of the IRIS server commands which do not require a complicated binary argument. This is useful if you wish to control IRIS from a shell script. For example you can type:

   $ **iris_client_shell –command=”RST LOAD DEFAULT”**

   Sorry, the complete list of commands is not documented. #572

8. The **ascope** utility source code is now include on the release.

Bug Repairs

1. The kickstart installation cdrom for RHEL5.2 did not work. There is now a version 3 kickstart disk for RHEL5.2 available both on our ftp site, and in hardcopy from Vaisala. #613

2. Fixed the IRIS menubar image. Bug was that when clicking on menu icons the wrong menu was popped up. This bug was introduced when we added the TSC Monitor Menu and the TSC Editor Menu in release 8.12.1. #617

3. The rc.d/tomcat5 initialization file now ships with the correct path for JAVA_HOME which is /usr/java/jdk1.5.0_14, #549

4. **Zauto** was getting the wrong I0 and Zcal outputs on the first press of the “fit” button, the numbers were correct after a second “fit”. #411

5. Fixed a bug in **suncal**. If you set the task range start larger than the BEAM range start as follows:

   sun_cal.fRangeStart = 30 sun_cal.fBeamRangeStart = 20

   You get a blank display. We removed entirely the fBeamRangeStart and there is just one start range. Also, the default start range is now raised from 20 to 100 km. This helps dramatically in avoiding interference from weather and airplanes. Please run “suncal –resave” and change you range start up to 100 after upgrading. #554

6. **Suncal** is also enhanced to allow it to run with RVP8 errors. On systems with a separate RVP8 from the antenna controller, the RVP8 will in many cases not know when the radiate is off, and will get “burst pulse missing” in that case, and **suncal** will abort. This prevents running **suncal** with radiate off, but radiation is not required for the **suncal**

calibration to work. There is a new config variable called lAbortOnMessages, which defaults to 1. If set to 0, all RVP8 errors of this sort are allowed. #608

7. We now enable the platform velocity correction button in the TCF for custom INU sources. #556

8. The new **TSC Editor Menu** is enhanced to alert you with a pop-up if you make changes, then try to exit without saving. #551

9. The QLW Track Tool is enhanced to add the track Point, Text and Icon on button–up. This allows you to drag and drop you points.

10. The **rtdisp** utility displayed a funny pull down of 20 dummy widgets in the overlay selection menu if no overlay files were found. #496

11. **Qiris** was leaving one set of semaphores still allocated. It was the IRIS_INPUTEF_CLUSTER. You could see this with ipcs. #582

12. **Qiris** was leaving the shared memory used by the socket server (sserver) still allocated. This only shows up on systems using IRIS/Web. #582

13. Fixed a bug in passive IRIS: If the passive system started a bit late, then it would sometimes stop the next sweep after just 1 ray. This was caused by a single zero pulse ray output by the RVP8. The zero pulse ray is always output, but it did not cause a problem if it happens while the elevation angle is transitioning between sweeps. Fixed this by waiting for 2 zero pulse rays in a row to abort the sweep. #583

14. IRIS is supposed to wait for the antenna to settle for a user configured time after the desired elevation angle was reached. In fact it was always waiting the full time. It is now modified to only wait additional time if the angle is getting better. This will make a big difference with passive IRIS when the active system does not have a wait in it. #584

15. The **sigconfig** script was setting the ownership on the /home directory by mistake. Also suppress warnings if the data directories are already there. #587

16. In the TSC editor menu, the user was not always prompted to save changes when menu was closed. This was only the case when adding or deleting tasks. Ticket #551

17. The **install** program was not erasing the previous installation. In effect it was as if the “keep old files” button was always pressed. This was broken since release 8.11.3. Previously we erased the old files only for install, app, config, manuals, tplates packages. We now do all this, plus headers, objects, source, or web. #517

IRIS 8.12.1 Release Notes (21 October 2008)

These notes cover changes made in IRIS since release 8.12.0 of 14 July 2008. If you are upgrading from an earlier release, please read those notes also. Revised to svn [20849]

Data Format Changes

1. We have added the following 3 numbers to the product_end structure of IRIS products; Vertical channel noise, LDR offset, & ZDR offset. #519

New Features

1. There is a big change made to the Task Scheduler Menu. It is replaced with two new menus: The "TSC Monitor Menu" and the "TSC Editor Menu". We have separated the function of monitoring the current scheduler state, from editing the schedules. This means that you can for the first time edit schedules which are not running. It is also no longer possible to change the TSC configuration without saving it. To further emphasize the difference between our live menus (which control state), and dead menus (which edit configurations), the live menus have replaced the "File/Load" pull–down with "File/Change...". For more details please read Chapter 7 of the *IRIS Radar Manual*. The server is still backward compatible to old clients, so on a rolling upgrade you will be able to use the TSC menu from old clients. #534
2. **Suncal** is enhanced to measure the dual-pol LDR offset. See the *RDA Release Notes* New Features 1. for details.
3. There is a new **zdrcal** utility available to measure the ZDR offset. See the *RDA Release Notes* New Features 2. for details.
4. Essentially all use of rcp and rsh in IRIS has been removed, now using ssh. Please configure your systems to allow ssh access with no password or passphrase prompts. Changes in: **irisnet**; the **bitex** launch button in RST; the **upi_xmt** example program. #513, #309, #532

Bug Repairs

1. The AAMPS UDP stream parser was added to the Malibu plugin. The actual stored extended header format has changed, so you need to install a new malibu plugin rpm. There is a new udp_pipe test utility, as well as a /etc/malibu.conf file. #341
2. In **IrisToBufr** we now fill in the new "International Data Sub Category" byte which was added to section 1 in BUFR Edition 4.
3. The IRIS User cursor now shows values in 1/1000 for values below 10. This is useful for RhoHV, rainrate and SQI.
4. The SCSI inquiry testing utility inquiry was ported to now work on Linux, #518.

5. If you have an input pipe and feed it files very quickly, and use socket notification, and create and close the socket connection each time, you will get a temporary file name collision. We also could have the same problem with permanent connections if there are more then one remote client connecting to one input. Fixed by adding the PID to temporary filenames. #520

6. Fixed a memory leak in **bitex** which dates back many years. It was leaking approximately 100 bytes/second for each panel on the display. #529

7. The RAIN1 products were forcing the minutes and seconds to zero for 1 hour intervals, but the milliseconds field was not. It was set to the milliseconds of one of the inputs. #531

8. The **ChangeTaskName** pipe was improved. It is now shipped with a template .conf file, and can now filter on both site name and task name. #533

9. Fixed broken help button in the **setup** program.

10. Fixed a bug in our processing of the SIGNALS.DAT file. The SetFault:Critical worked as advertised, but SetFault:Warning did nothing. This includes adding new fault bits to the ingest_configuration structure and the STAT products. #535

11. We have been shipping separate release files for RHEL5 vs RHEL4 since 8.11.7. Unfortunately it was possible to install the RHEL5 release on an older OS, which does not work at all. We now check to make sure it matches, and ask an “are you sure?” type question if the kernel does not match. Since there are lots of different Linux kernels out there, we do allow the installer to override if needed. #475

12. Removed the emacs toggle button from the install GUI. This did not do much, since emacs is supplied with Linux.

13. Added **tsview** to the IRIS release #538

14. Fixed a bug in IRIS in which you got an RPC timeout error, and IRIS was essentially not functioning. It required that the system run for a while before it happened. **Qiris** worked poorly, but you could quit if you typed “qiris –override” and waited for it to timeout. If you did a **show_iris** you would see the error log event flag locked.

    Here is what was going on: IRIS puts all error messages into a log file. After the first 800 errors, it switches to a second log file, called IRIS_ERROR.RING. In this file it limits the length of the error information messages to 160 characters total. There is about 78 character overhead, which means if the message string is over about 82 characters, it will be truncated. The truncation code was broken, and the system would lock up. So, in summary, if you signal a long message, after the first 800 messages, the system would lock up. This bug has been in our systems since release 8.07.4 in December 2004. #335.

IRIS 8.12.0 Release Notes (14 July 2008)

These notes cover changes made in IRIS since release 8.11.7 of 3 March 2008. If you are upgrading from an earlier release, please read those notes also. Revised to svn [20334]

Installation Changes

1. We have changed our OS install script cdroms to version 2. The only change is that now we set the graphics be in 24-bit mode. We also now supply a RHEL5.2 and Centos5.1 cdrom. These are available from Vaisala, and on our ftp site in outgoing/releases/install_v2.

2. Fixed bugs in our **sigconfig** script used to help install IRIS. If you ran it multiple times it would mess up the /usr/share/hwdata/pci.ids file which could cause your video card to disappear. It was also messing up the etc/xinetd.d/rsh file causing rsh to fail. #404 It was also not automatically installing Acroread. #438

3. Removed the Tomcat toggle button from the **install** GUI. Tomcat5 is now supplied with the RHEL5 media. For RHEL4 installations we supply manual instructions. Please see Appendix F of the *Software Installation Manual* for details.

New Features

1. Dual-Polarization Attenuation correction is now operational in IRIS Reingest process. This can be turned on with a setup question in the Ingest section. Many bugs were fixed in the DP Attenuation feature in the RVP8 since the 8.11.7 release: The DP attenuation was not considering altitude of the radar in it's calculations, #470. The DP attenuation was not using the melting level passed in from the parent application, #471.

2. There were major changes to the BUFR pipes, including:

   - We have now switched to using the OPERA version 3.0 library. We are using the new calls in the 3.0 library so BUFR Edition 4 is now supported. The library is LGPL licensed and is installed as a shared library via a separate RPM. If you wish to use the BUFR pipes, please install this as follows:

     Mount the IRIS/RDA release cdrom and look in the directory RHEL5/extras/RPMS. For RHEL4, use the RHEL4 tree. If you do not have a release cdrom, you can get them from our ftp site: ftp://ftp.sigmet.com/outgoing/os_patches/RHEL5/RPMS. Install with the following commands:

     ```
     # rpm –Uhv bufr–3.0–2.i386.rpm
     # rpm –Uhv bufr–devel–3.0–2.i386.rpm
     ```

     The "devel" file only needed if you wish to recompile the BUFR pipes. This is LGPL licensed software, so the source rpm is also available in the SRPMS directory.

     After upgrading, you will now find your BUFR tables in the directory /usr/share/bufr. Previously they were in /usr/sigmet/config/bufr, which is now empty. #407

- **IrisToBufr** now conforms to the OPERA WD_2006_14 guidelines. **BufrToIris** can handle the changes also. This includes the radar position, so we can now handle a file with a radar not centered. We have changed the default values in IrisToBufr.conf to BUFR Edition 4, Master Table 13, bit_per_pixel 8 (up from 3, 11, 4). #155
- The GTS header created by **IrisToBufr** now follows OPERA WD_2006_19. Previously it followed the 2005 OPERA guidelines. The template .conf file is changed. #272
- We can now produce BUFR vertical profiles with Z, Winds or both based on what is in the IRIS VVP product. Also read such files back into IRIS. #273
- **IrisToBufr** was putting in junk values when it overflowed the number of bits in the descriptor. We now clip such values, and log it. This problem was almost guaranteed to happen with ZDR data. #449
- **BufrToIris** was failing for long lines in the .conf files, with no error report
- **IrisToBufr** was producing output values low by 1 step. Values exactly on the scale seams were correct. #436
- MAX products were converted wrong in **BufrToIris**. It was placing the top side panel on the bottom. #450
- **BufrToIris** now can fill in time zones better, includes changes to BufrToIris.conf. #452
- **IrisToBufr** was not filling in the time and the correct BUFR Edition number into BUFR section 1. The time was all zeroed, and the edition was set to 2. #454
- **IrisToBufr** was completely messing up the data level tables for SRI rainrate products. This was because rainrate is stored in 16-bits in IRIS. #455
- **BufrToIris** was incorrectly setting all rainfall accumulation data (RAIN1 and RAINN products) with data high by 0.1 mm. #461

3. The VVP product configuration menu is enhanced to add a button to turn on/off the horizontal winds. Previously this was always defaulted on. This is used if you wish to run the VVP product to just make a reflectivity profile. #273
4. **Productx** can print out 3D CAPPI data. You select the height using the –sweep option similar to **rays**.
5. The IRIS ingest velocity corrections (unfolding and fallspeed) now work correctly on 16-bit data.
6. We changed the Projection Menu to display Lat and Lon in decimal degrees so we can see more resolution. #508

Bug Repairs

1. Fixed bugs in the projection configuration menu. If you clicked back and forth on various numbers, it would change some of the spreadsheet values. This was partially

fixed by an extra digit to the ranges. Also fixed some math errors. Also fixed calculations when a corner point is fixed. In such cases, the ranges cannot be changed, and are now desensitized. If you fix a corner point, you can only specify the region by moving one of the other two points. #473

2. Switched back the IRIS projection bounding box definition to use a center point and range along the earth's surface. In 8.11.6 we changed this to use range on the projection grid. #473

3. The ingest summary menu was missing the new RHIF option from the filter choices for the scan type. #405

4. In **setup**, raised the maximum elevation scan speed to 72 degrees/second in support of fast scanning antennas. #410

5. Using the Track Tool on an RHI product could cause the window to crash. #403

6. We now set default values of time lag and dwell time in QLW slide show list, if left blank when configuring. Previously you could get zero, and crash the window. #395

7. In **rtdisp**, we now blank and update the display window whenever the task name changes in sector PPI scans and sector RHI scans. This is important because the sector limits may change, and we need to erase old data. #408

8. If you attempt to reingest a RAW product which already has ingest files, then you get the error message "Attempt to lock a semaphore (0x2) that is already locked. The system will quickly lock up afterwards because it leaves a semaphore locked. #106

9. A sector blanking in ingest taking more than 20 seconds was causing a fault. We now do not fault for no data in a blanked sector at all. #439

10. The IRIS/Web release was not all actually getting on the release disk. So the 8.11.7 release would work.

11. You can get the error "Invalid argument to mpj_pin_region" when you attempt to load a named projection in the Product Configuration Menu. This dates back to changes made in [15446] on 12/17/04 in release 8.09. #451

12. Fixed a bug **tsarchive**. Each time the GUI was launched, it would rescan the time series directory causing playback state to be erased, and a time delay.

13. Old IRIS versions did not store the reference latitude for Mercator and Polar Stereographic projections. When reading old files, we now replace the zero with the center latitude for Mercator, and with 90 degrees for Polar Stereographic. This preserves the legacy scaling interpretation. #459

14. Fixed a bug in RAIN1 product scheduling when running with rain gage corrections on an analysis system. It was failing to run at all if there were hours of radar data without a corresponding GAGE product. It now runs, and applies no gage correction for such hours. The Hydromet appendix was revised to cover this case. #463

15. The Display Options Menu's named overlay layers delete button was not working on some systems.

16. **IRIS/Web** was broken in the last release 8.11.7, fixed now. **Instiris** and **install** were not setting the protections correctly. #463

17. The File/Printer_setup menu from our displays was always outputting in PostScript even if you asked for jpeg of gif. Broken in release 8.11.7. #469

18. We changed our projection bounding box math to adjust the region to match to within 1/1000 of a pixel. Previously it was happy with an error of 1/2 pixel. This can make changes to some images on the order of 1/100 of a degree. #473

19. All the ingest data corrections now work on both 8 and 16-bit data. Perviously they were only implemented for 8-bit data. #485

20. The RAW product configuration menu allows you to convert data from 8-bit to 16-bit format and vice versa. This feature was broken for some of the newer data types, specifically for dBZc, Vc, ZDRc, User and HClass. #484

21. Syntax errors in the beam_block.conf file would crash reingest. In some cases the syntax error details were not even signalled. #497

22. If you are running in 16-bit mode, and the real-time display transmitter is set to send ZVW data only, you would not get Z. Also you would get 1-byte Zc. #495

23. If the IRIS Reingest process crashed, it would leave the RAW product marked as in-use, which will prevent anyone from deleting it. #500

24. The QLW was crashing when using the slidebar in the Track/Annotate Tool and displaying an RHI product. #415

25. There was a bug introduced in release 8.11.2 in the product scheduler for hybrid tasks. If you specified the hybrid subtask list using "*", and the hybrid scan had an even number of subtasks, it would fail to run until the first subtask of the next volume arrived. It would work correctly if you specified the subtasks explicitly, such as "A–F". #510