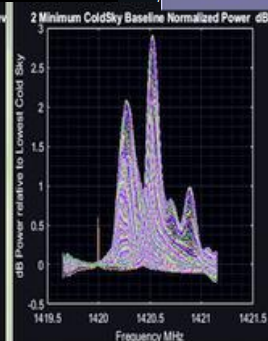
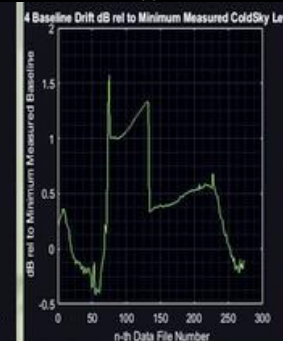
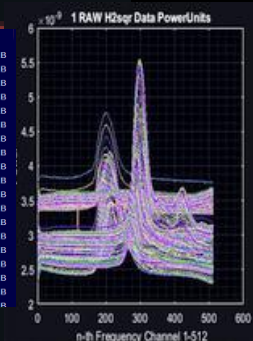
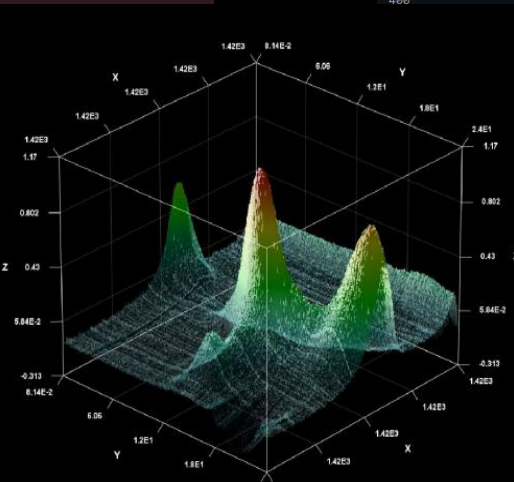


File Conversion & Spectral Processing Software

```
198 303 raDegreesRadioButton.addActionListener(new ActionListener() {
199 304 @Override
200 305 public void actionPerformed(ActionEvent e) {
201 306 - dataCruncher.rightAscensionCalculator.setInitialRa(raStartTextField.getText());
202 307 + dataCruncher.rightAscensionCalculator.setInitialRaFromStrings(raStartTextField.getText(), raStartTextField.getText());
203 308 dataCruncher.rightAscensionCalculator.setRaFormat(RaFormat.RA_FORMAT_DEFAULT);
204 309 //raStartTextField.setFormatterFactory(new
205 310 DefaultFormatterFactory(dataCruncher.rightAscensionCalculator.getRaFormat().getFormatter());
206 311 raStartTextField.setText(dataCruncher.rightAscensionCalculator.getRaFormat().getRaFormat());
207 312 });
208 313 - outfileTextField.getDocument().addDocumentListener(new DocumentListener() {
209 314 + sessionNameTextField.getDocument().addDocumentListener(new DocumentListener() {
210 315 @Override
211 316 public void removeUpdate(DocumentEvent e) {
212 317 - System.out.println("Outfile text: " + outfileTextField.getText());
213 318 + dataCruncher.setOutFileName(outfileTextField.getText());
214 319 sessionName = sessionNameTextField.getText();
215 320 System.out.println("Session name: " + sessionName);
216 321 } // removeUpdate()
217 322 @Override
218 323 public void insertUpdate(DocumentEvent e) {
```

Name	Date modified	Type	Size
D40_RA00_0001.txt	3/30/2023 12:56 PM	Text Document	15 KB
D40_RA00_0002.txt	3/30/2023 1:01 PM	Text Document	15 KB
D40_RA00_0003.txt	3/30/2023 1:06 PM	Text Document	15 KB
D40_RA00_0004.txt	3/30/2023 1:12 PM	Text Document	15 KB
D40_RA00_0005.txt	3/30/2023 1:17 PM	Text Document	15 KB
D40_RA00_0006.txt	3/30/2023 1:22 PM	Text Document	15 KB
D40_RA00_0007.txt	3/30/2023 1:27 PM	Text Document	15 KB
D40_RA00_0008.txt	3/30/2023 1:33 PM	Text Document	15 KB
D40_RA00_0009.txt	3/30/2023 1:38 PM	Text Document	15 KB
D40_RA00_0010.txt	3/30/2023 1:43 PM	Text Document	15 KB
D40_RA00_0011.txt	3/30/2023 1:49 PM	Text Document	15 KB
D40_RA00_0012.txt	3/30/2023 1:54 PM	Text Document	15 KB
D40_RA00_0013.txt	3/30/2023 1:59 PM	Text Document	15 KB
D40_RA00_0014.txt	3/30/2023 2:04 PM	Text Document	15 KB
D40_RA00_0015.txt	3/30/2023 2:10 PM	Text Document	15 KB
D40_RA00_0016.txt	3/30/2023 2:15 PM	Text Document	15 KB
D40_RA00_0017.txt	3/30/2023 2:20 PM	Text Document	15 KB
D40_RA00_0018.txt	3/30/2023 2:25 PM	Text Document	15 KB
D40_RA00_0019.txt	3/30/2023 2:30 PM	Text Document	15 KB



Convert If_Avg -> CSV Version: js_ap_vsrMX0_intlogo_11jan25_01

Project: H Line 3D

Choose Dir: [] Clear

#.txt Files found in Directory: []

CSN Low 5% to 75% - Cold Sky Normalization - CSN High 75% to 95%

5 90

Row and Column Units for CSV Files

☒ Frequencies ☒ RA

☐ Velocities ☐ Seconds

☐ Sequential file #

Starting RA: []

☒ HEMISS ☐ IBLHHH ☐ Degrees

IFAvg_File_Name (_ added info) = ".CSV File_Name"

Process Done

```
sColorGradient xGradient = new ColorGradient.AxisColorGradient();
(ColorGradient.Axis.X);
daryColors(new Color[] {clearBlack, Color.RED});
dMode(ColorGradient.BlendMode.ADDITION);

sColorGradient yGradient = new ColorGradient.AxisColorGradient();
(ColorGradient.Axis.Y);
daryColors(new Color[] {clearBlack, Color.GREEN});
dMode(ColorGradient.BlendMode.ADDITION);

sColorGradient zGradient = new ColorGradient.AxisColorGradient();
(ColorGradient.Axis.Z);
daryColors(new Color[] {clearBlack, Color.BLUE});
dMode(ColorGradient.BlendMode.ADDITION);
```

JRE : Java Runtime Environment (Windows)

Java version(s): 8.0 Platform(s):

Windows 11, Windows 10, Windows 8, Windows 7, Windows Vista, Windows XP,

https://www.java.com/en/download/help/windows_offline_download.html

install JRE

Jamison Adcock : JA_IFAvg2csv.jar :

Conversion of a data set of IF_Ave *.txt files to Rinearn compatible *.csv files

<https://github.com/AP-HLine-3D/HLine3D>

download latest Revision of [JA_IFAvg2csv.jar](#) and drag to Desktop

Rinearn 2D & 3D Graphics Software

<https://www.rinearn.com/en-us/graph2d/>

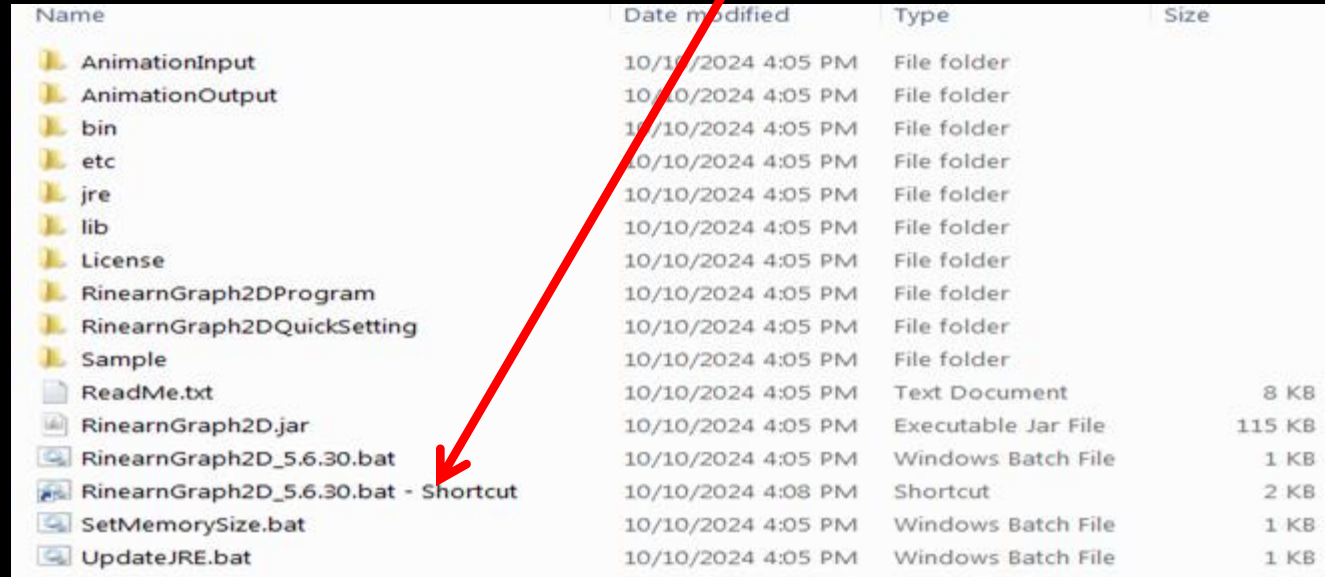
<https://www.rinearn.com/en-us/graph3d/>

download and install 2D and 3D

Graphics Software

Rinearn 2D Graphics Software

From installation subdirectory , **create Shortcut** to *RinearnGraph2D_5.6.30.bat* and Drag Shortcut to Desktop

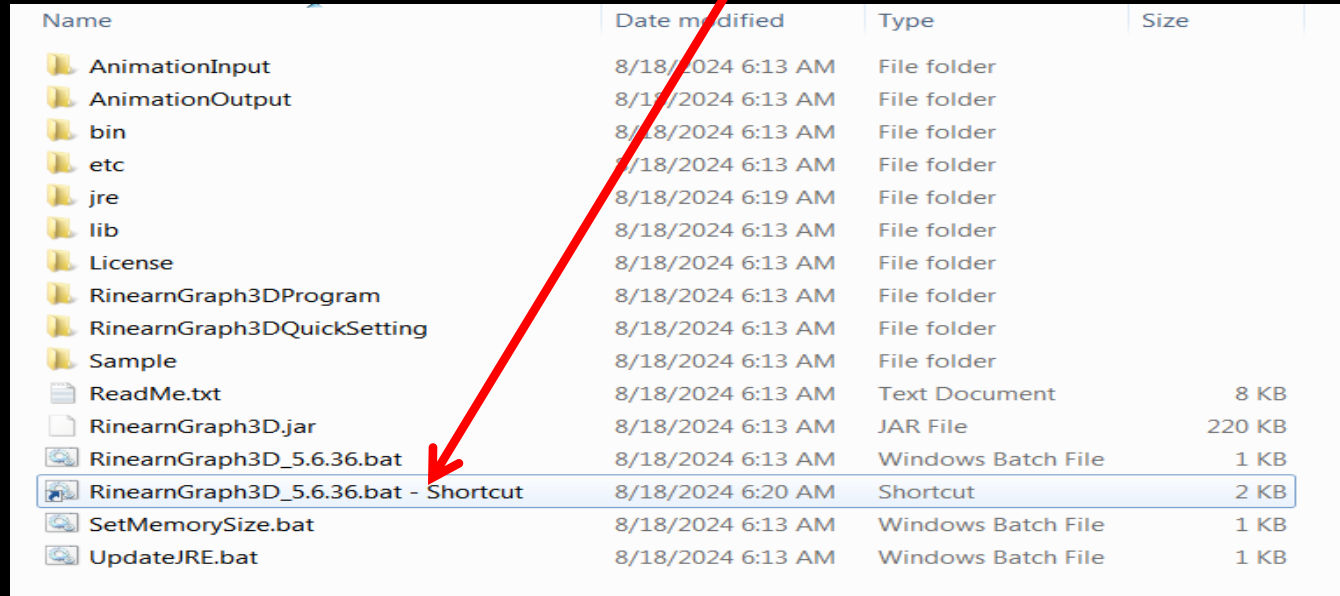


Name	Date modified	Type	Size
AnimationInput	10/10/2024 4:05 PM	File folder	
AnimationOutput	10/10/2024 4:05 PM	File folder	
bin	10/10/2024 4:05 PM	File folder	
etc	10/10/2024 4:05 PM	File folder	
jre	10/10/2024 4:05 PM	File folder	
lib	10/10/2024 4:05 PM	File folder	
License	10/10/2024 4:05 PM	File folder	
RinearnGraph2DProgram	10/10/2024 4:05 PM	File folder	
RinearnGraph2DQuickSetting	10/10/2024 4:05 PM	File folder	
Sample	10/10/2024 4:05 PM	File folder	
ReadMe.txt	10/10/2024 4:05 PM	Text Document	8 KB
RinearnGraph2D.jar	10/10/2024 4:05 PM	Executable Jar File	115 KB
RinearnGraph2D_5.6.30.bat	10/10/2024 4:05 PM	Windows Batch File	1 KB
RinearnGraph2D_5.6.30.bat - Shortcut	10/10/2024 4:08 PM	Shortcut	2 KB
SetMemorySize.bat	10/10/2024 4:05 PM	Windows Batch File	1 KB
UpdateJRE.bat	10/10/2024 4:05 PM	Windows Batch File	1 KB

Graphics Software

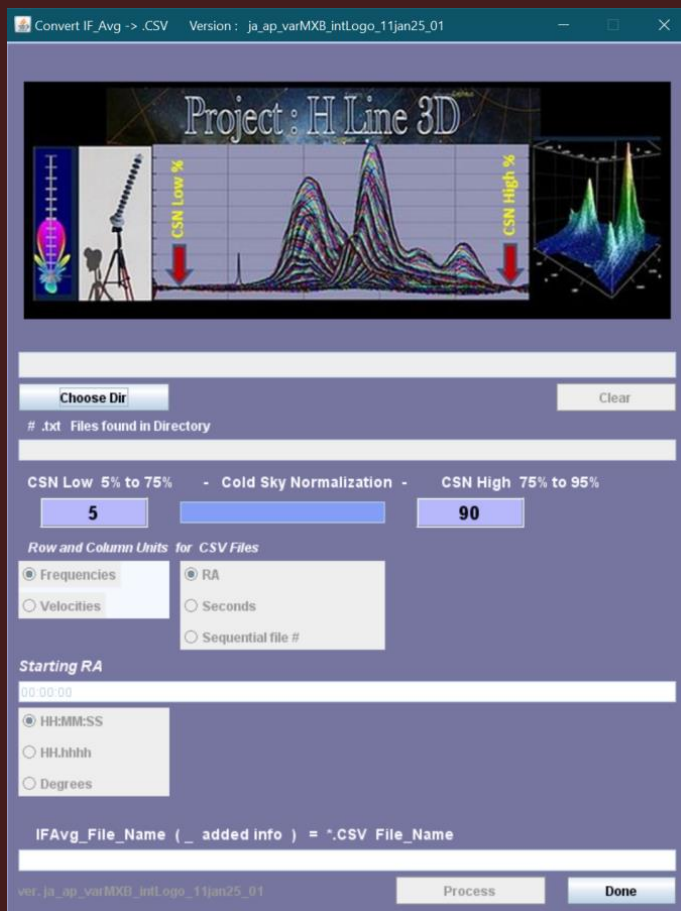
Rinearn 3D Graphics Software

From installation subdirectory , **create Shortcut** to *RinearnGraph3D_5.6.36.bat* and Drag Shortcut to Desktop



Name	Date modified	Type	Size
AnimationInput	8/18/2024 6:13 AM	File folder	
AnimationOutput	8/18/2024 6:13 AM	File folder	
bin	8/18/2024 6:13 AM	File folder	
etc	8/18/2024 6:13 AM	File folder	
jre	8/18/2024 6:19 AM	File folder	
lib	8/18/2024 6:13 AM	File folder	
License	8/18/2024 6:13 AM	File folder	
RinearnGraph3DProgram	8/18/2024 6:13 AM	File folder	
RinearnGraph3DQuickSetting	8/18/2024 6:13 AM	File folder	
Sample	8/18/2024 6:13 AM	File folder	
ReadMe.txt	8/18/2024 6:13 AM	Text Document	8 KB
RinearnGraph3D.jar	8/18/2024 6:13 AM	JAR File	220 KB
RinearnGraph3D_5.6.36.bat	8/18/2024 6:13 AM	Windows Batch File	1 KB
RinearnGraph3D_5.6.36.bat - Shortcut	8/18/2024 6:20 AM	Shortcut	2 KB
SetMemorySize.bat	8/18/2024 6:13 AM	Windows Batch File	1 KB
UpdateJRE.bat	8/18/2024 6:13 AM	Windows Batch File	1 KB

Jamison Adcock : JA_IFAvg2CSV.jar Processing Software Installation



JA_IFAvg2csv.jar :

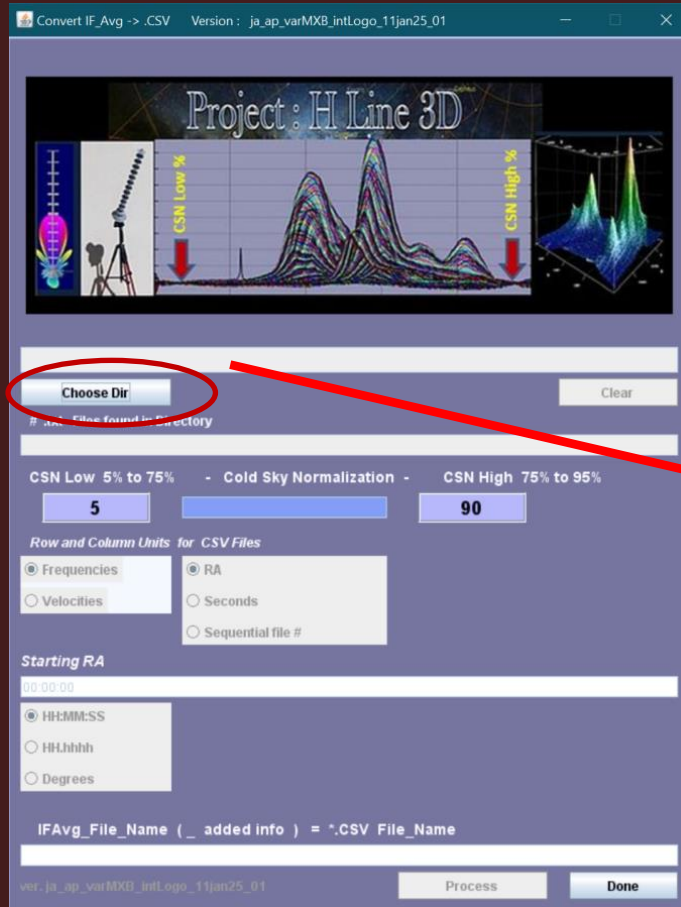
**Conversion of a subdirectory data set
of IF_Ave *.txt files to Rinearn compatible *.csv**

<https://github.com/AP-HLine-3D/HLine3D/>

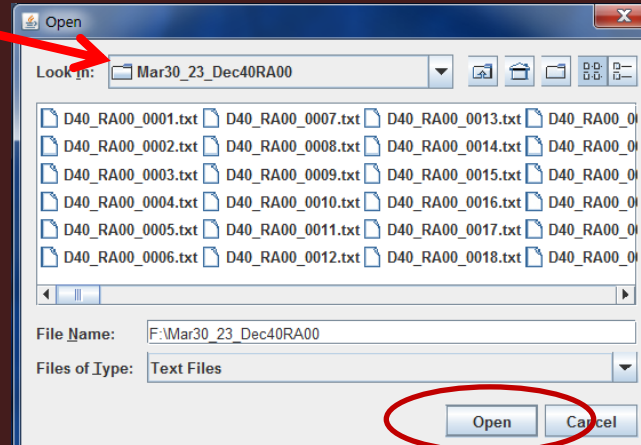
download Latest Rev of JA_IFAvg2csv.jar and drag to Desktop

 **JA_IFAvg2csv_varMXB_intLogo_11Jan2501.jar**

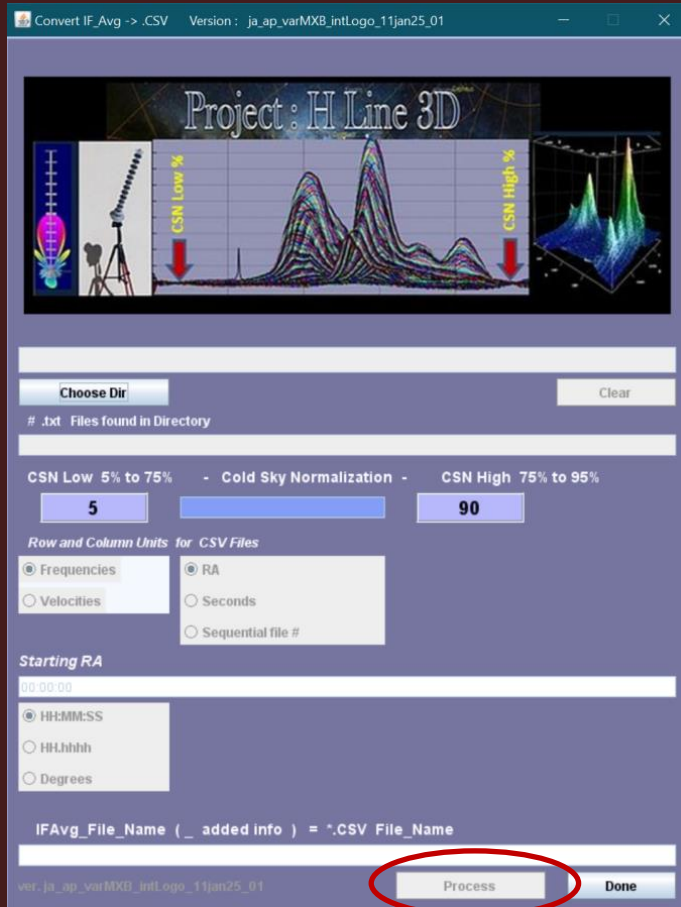
JA_IFAvg2CSV.jar Processing Software Guide



1) Select 'Choose Dir', Fileset and 'Open'

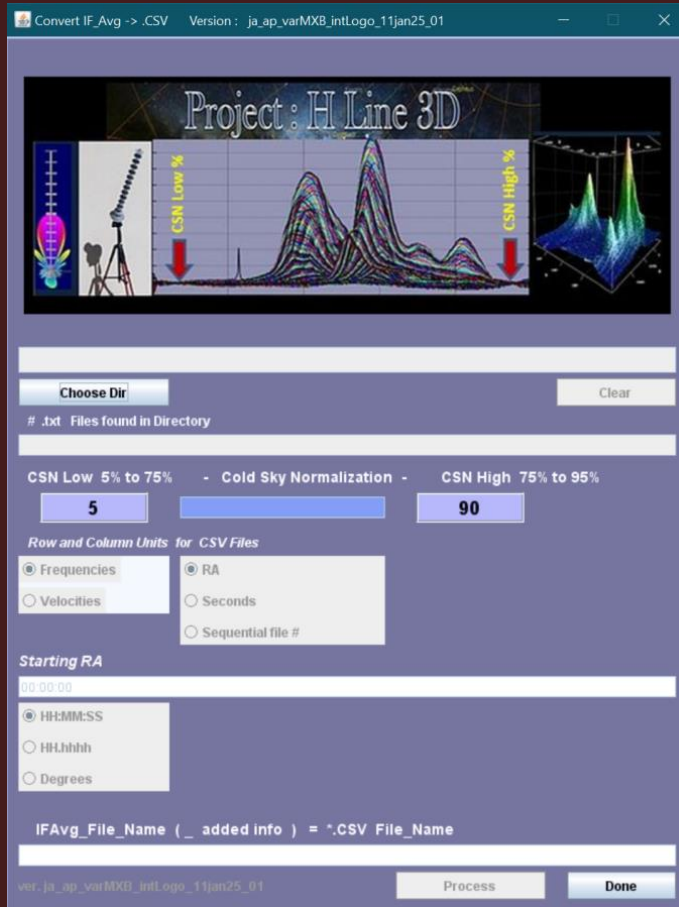


JA_IFAvg2CSV.jar Processing Software Guide

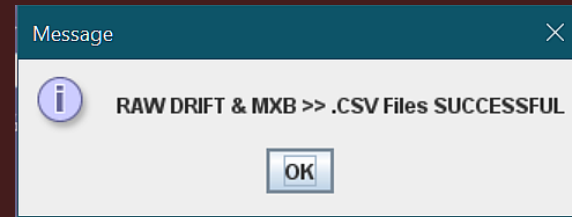
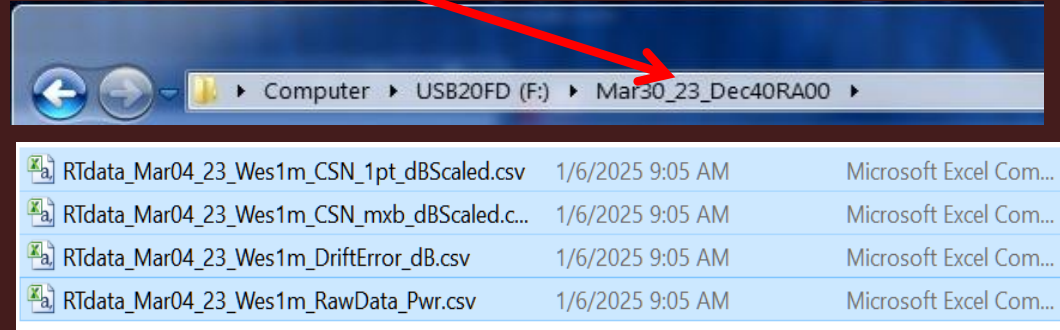


2) (optional append info to) 'Session Name' and 'Process'

JA_IFAvg2CSV.jar Processing Software Guide



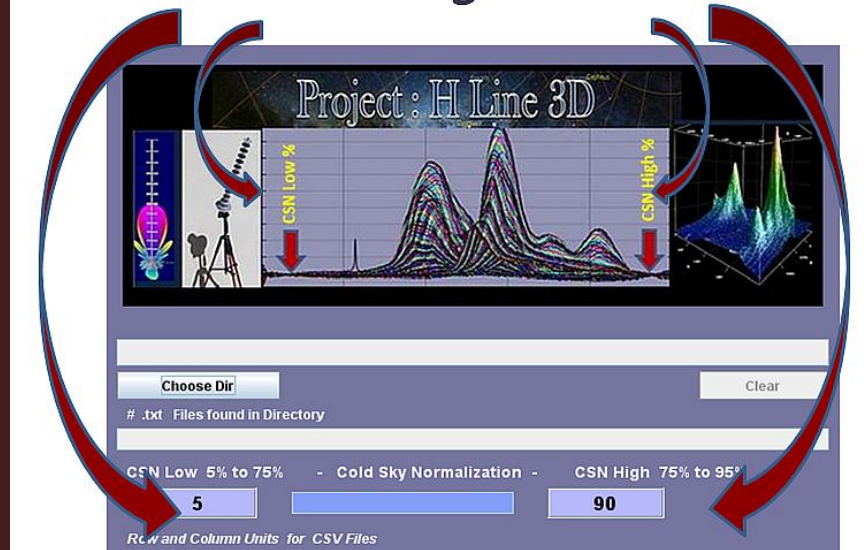
3) *.CSV files will be written to original Fileset Directory



JA_IFAvg2CSV.jar Processing Software Guide

2 point *Cold Sky Normalization*
***mx + b* 2 pt data set correction**

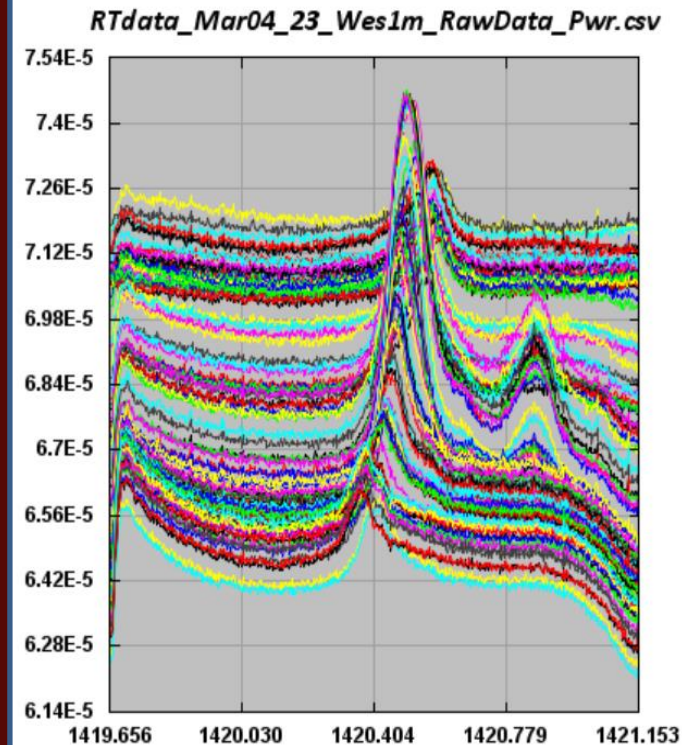
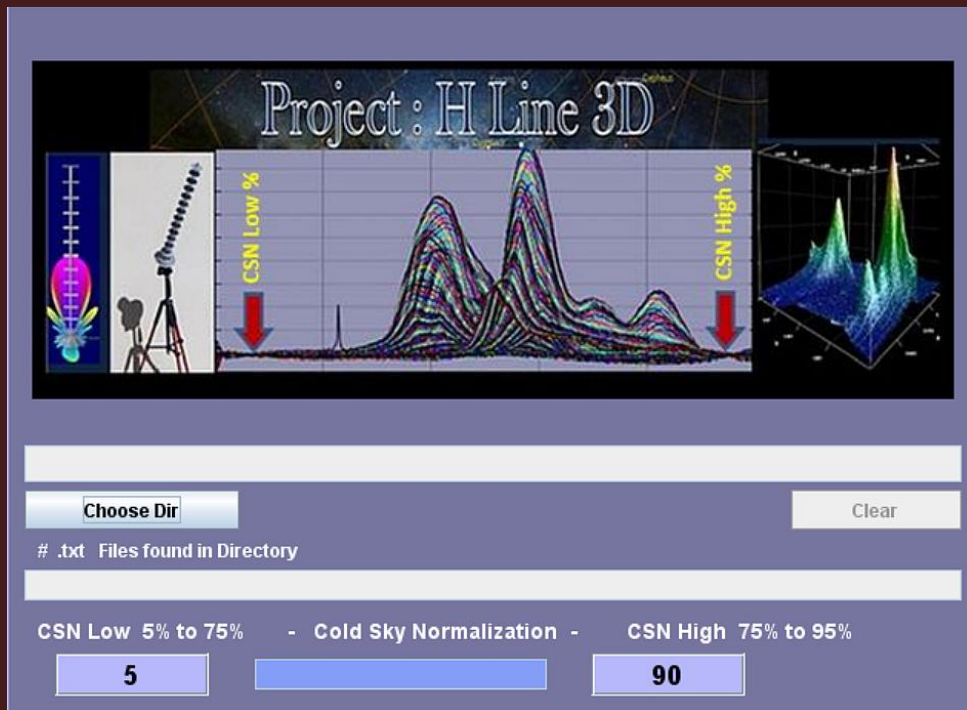
set low and high % values



**Enter %Low and %High Frequencies
for Cold_Sky_Normalization (CSN)**

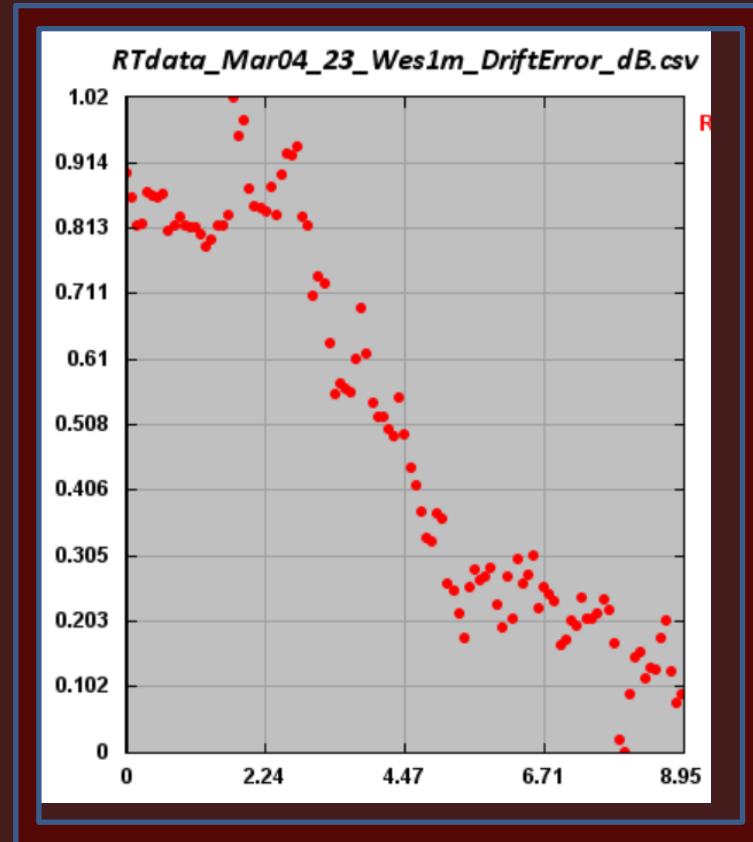
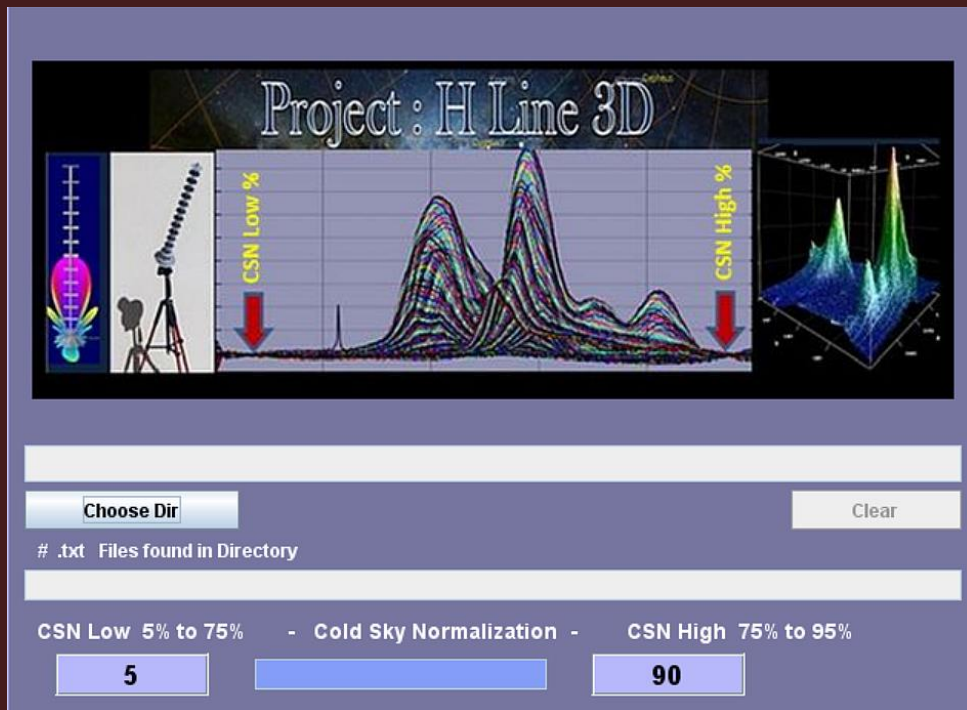
JA_IFAvg2CSV.jar Processing Software Guide

1) Raw Uncorrected Data containing frame to frame drift



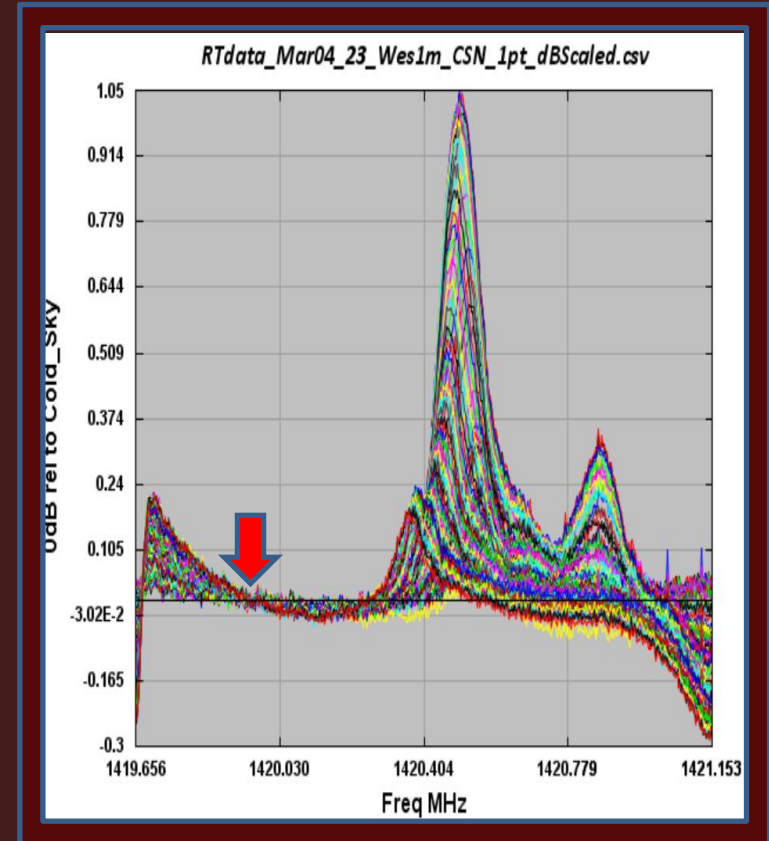
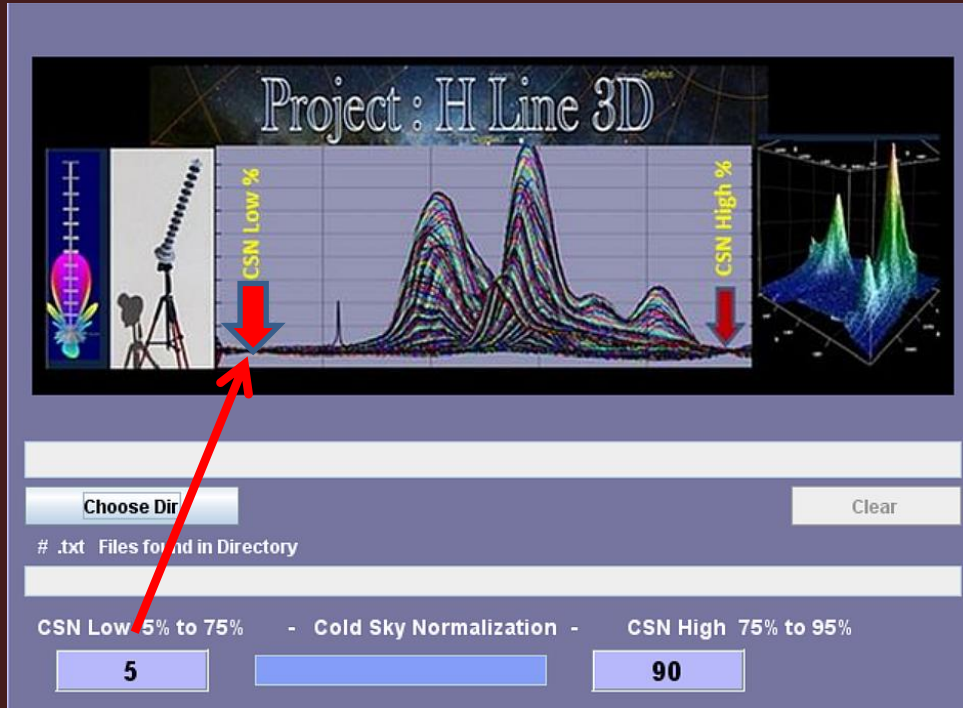
JA_IFAvg2CSV.jar Processing Software Guide

2) Frame to Frame drift X axis Hours of Time



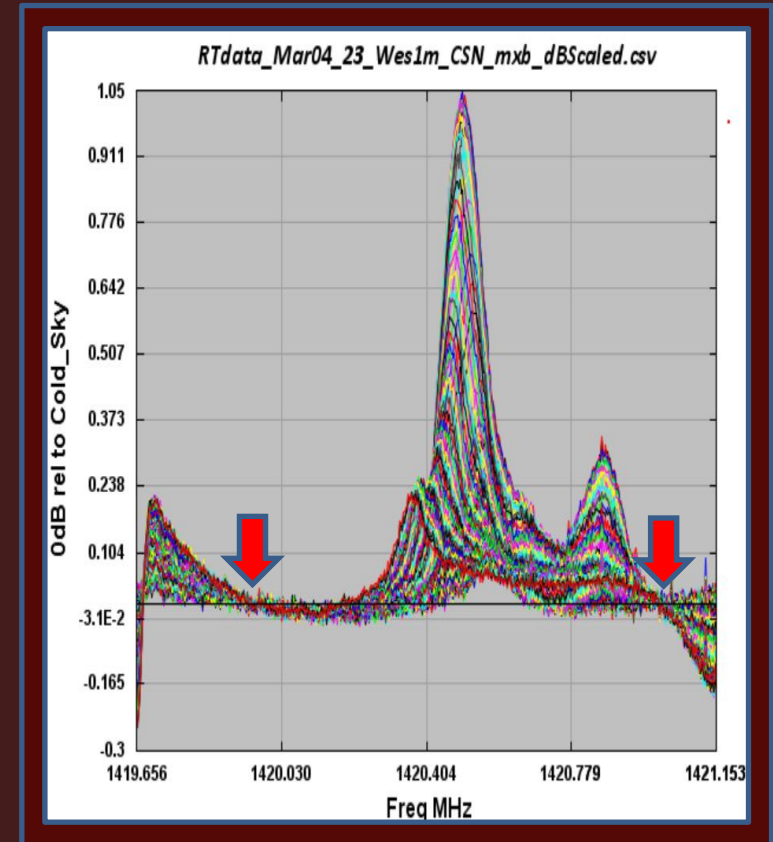
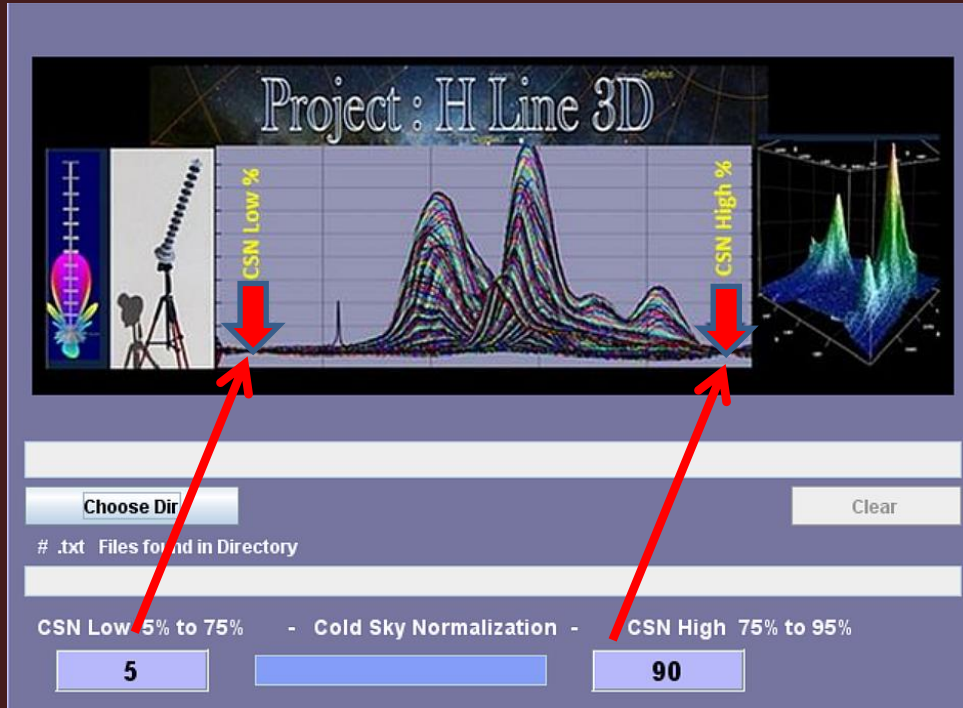
JA_IFAvg2CSV.jar Processing Software Guide

3) %Low Single 1pt Linear Drift CSN normalized



JA_IFAvg2CSV.jar Processing Software Guide

4) %Low and %High 2pt mx+b Slope CSN normalized



JA_IFAvg2CSV.jar Processing Workflow

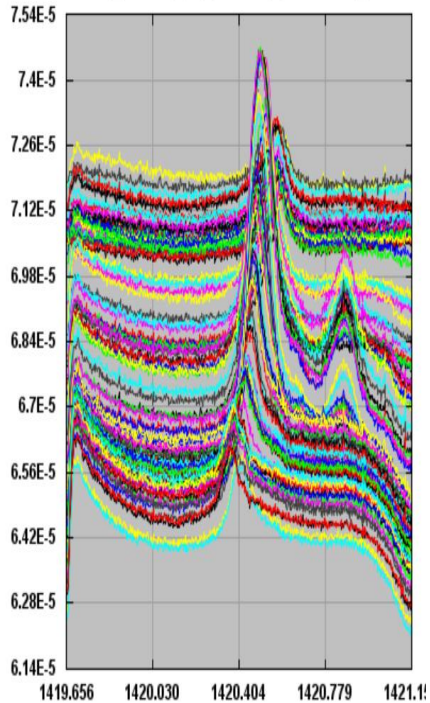
1) **Raw Data** containing
frame to frame drift

2) **Frame to Frame Drift**
X axis Hours of Time

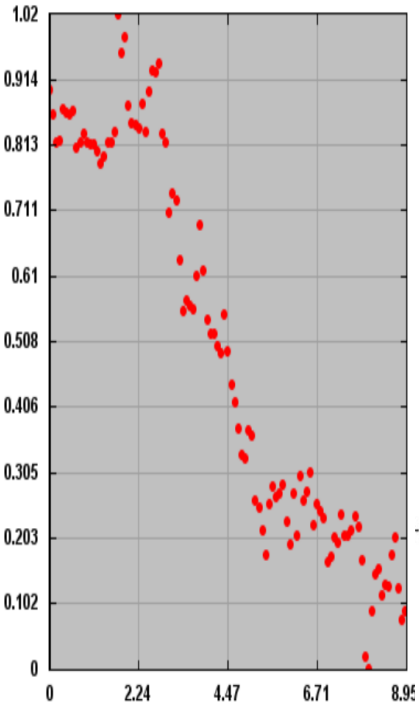
3) **%Low 1pt Linear**
CSN normalized

4) **%Low & %High 2pt mx+b Slope**
CSN normalized

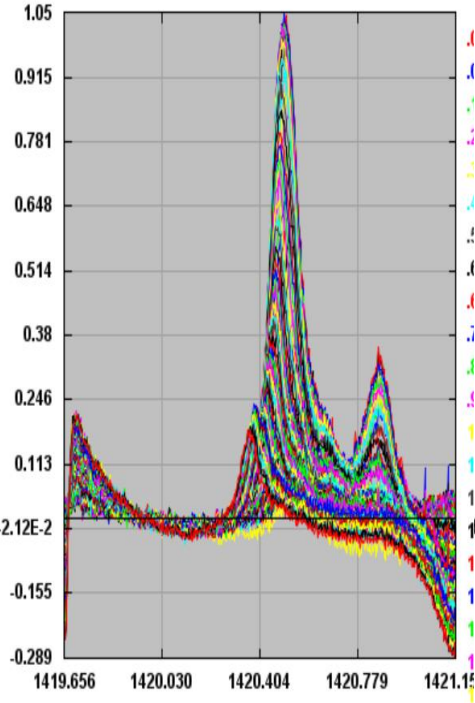
RTdata_Mar04_23_Wes1m_RawData_Pwr.csv



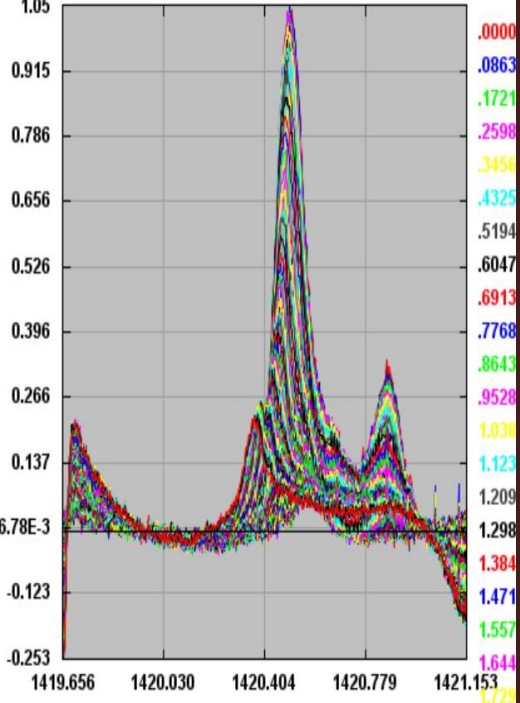
RTdata_Mar04_23_Wes1m_DriftError_dB.csv



RTdata_Mar04_23_Wes1m_CSN_1pt_dBScaled.c

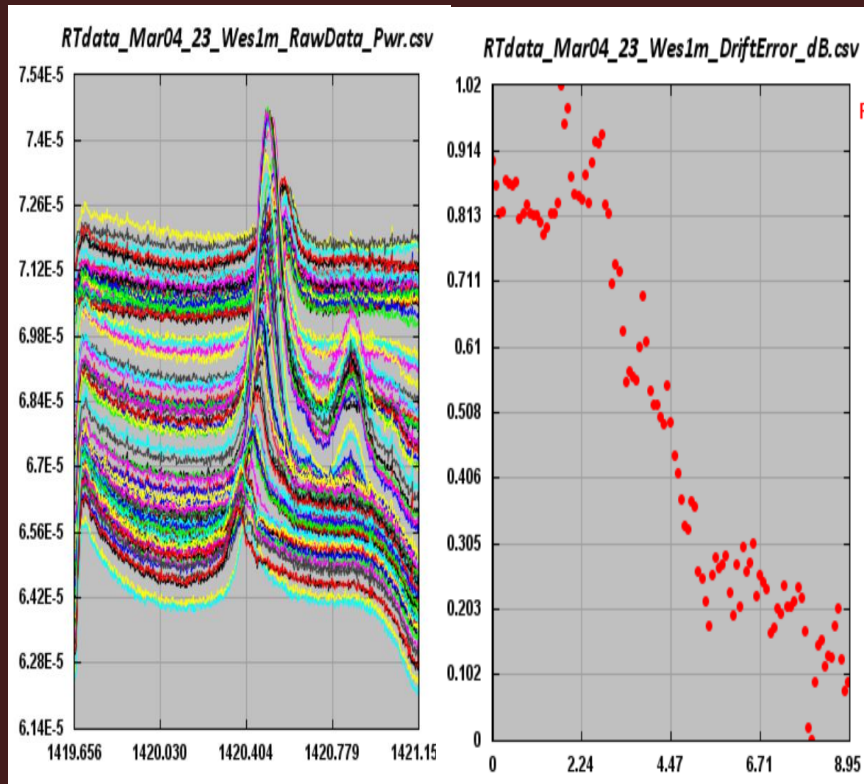


RTdata_Mar04_23_Wes1m_CSN_mxb_dBScaled.csv



JA_IFAvg2CSV.jar Processing Workflow

“ Cold Sky Normalization” 1 pt Linear Background Drift Correction



During the time period in which spectral data is being acquired, many factors may cause an overall background level shift ...

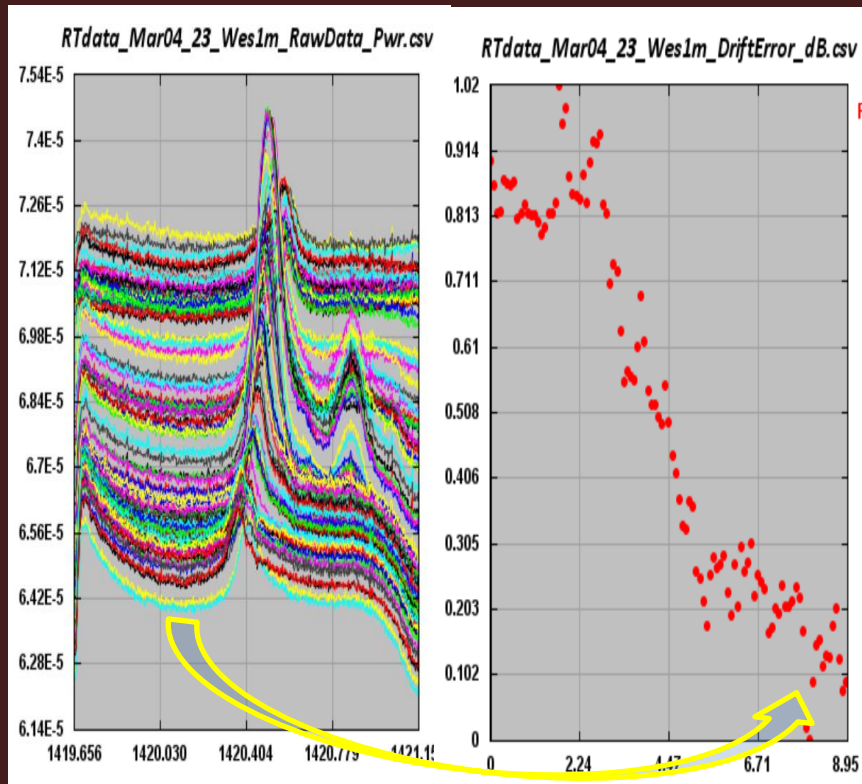
- 1) Atmospheric Transparency
- 2) Sunlight
being received in the antenna's beam side-lobe patterns
or being reflected off nearby vegetation
(trees, buildings, bushes)
- 3) Temperature Changes
in the surrounding environment
or heating of the antenna and electrical components

FYI : The nooelec SAWBird H1 LNA has a thermal amp gain drift of only $-0.1 \text{ dB} / +10 \text{ dgC}$.

As such, the corrections are considered changes in noise level and the drift is *subtracted from* the data referenced to the lowest value rather than *divided by* as would be done for correcting amplifier gain change.

JA_IFAvg2CSV.jar Processing Workflow

“Cold Sky Normalization” 1 pt Linear Background Drift Correction



The Background Drift can be measured and plotted.

Step #1 Specify a frequency (%Low) below than any Hydrogen Line data with which to ‘Normalize’ the Drift
This can be considered the “Cold Sky” Background

Step #2 Find the spectrum with the **Lowest Amplitude** at that range and use it as the **Drift Correction Reference**.

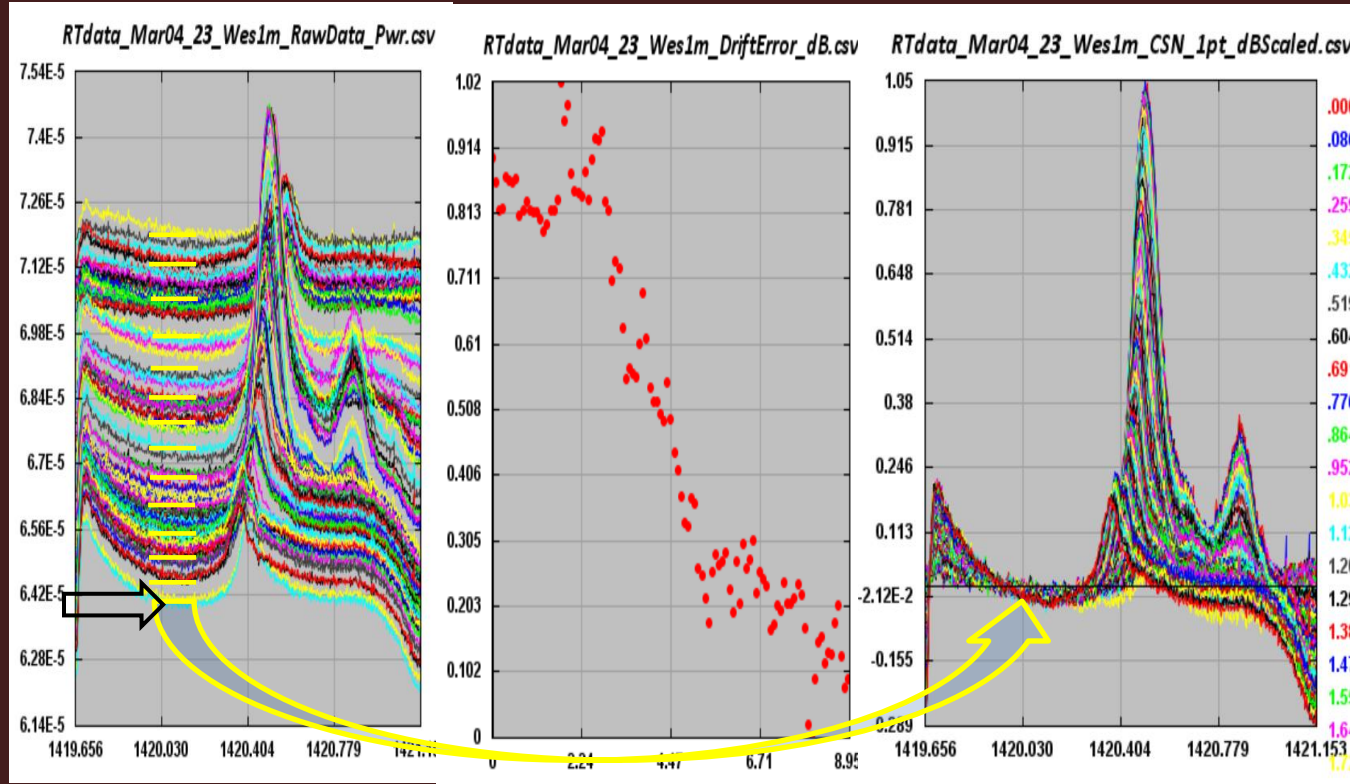
Step#3 For each spectra, calculate the difference in amplitude between its average value over the drift correction frequency range and the Reference, and subtract that from all values in that spectrum

Step#4 Repeat that for each of the spectra.

Lowest Amplitude = Linear Drift Correction Reference

JA_IFAvg2CSV.jar Processing Workflow

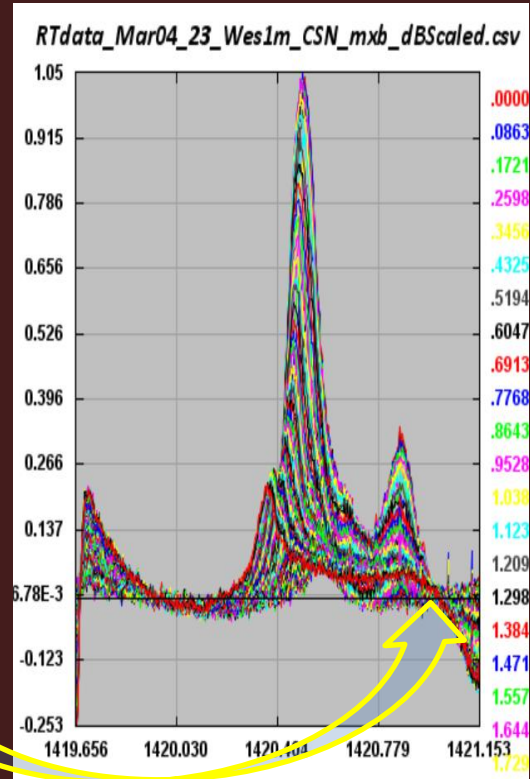
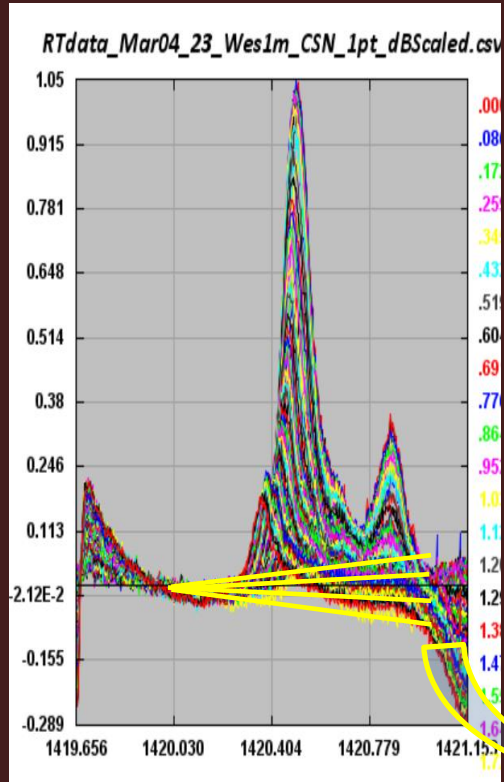
“Cold Sky Normalization” 1 pt Linear Background Drift Correction



“Cold-Sky” Drift Corrected Spectrum Set

JA_IFAvg2CSV.jar Processing Workflow

“Cold Sky Normalization” 2 pt mx+b Slope Background Drift Correction



Step #1 Specify the %High frequency above any Hydrogen Line data with which to 'Normalize' And correct the Slope Drift
This is also the “Cold Sky” Background

Step #2 Find the difference of each spectrum above or below the “Cold Sky”

Step#3 For each spectra, calculate an mx+b Slope correction and subtract that from the spectrum error

Step#4 Repeat that for each of the spectra.

“Cold Sky” Background Drift Corrected Spectrum Set Scaled in dB

A Decibel Scale is a Logarithmic Scale which enables data with amplitudes over many orders of magnitude to be displayed with ‘nearly equal’ *physical size* on a plot

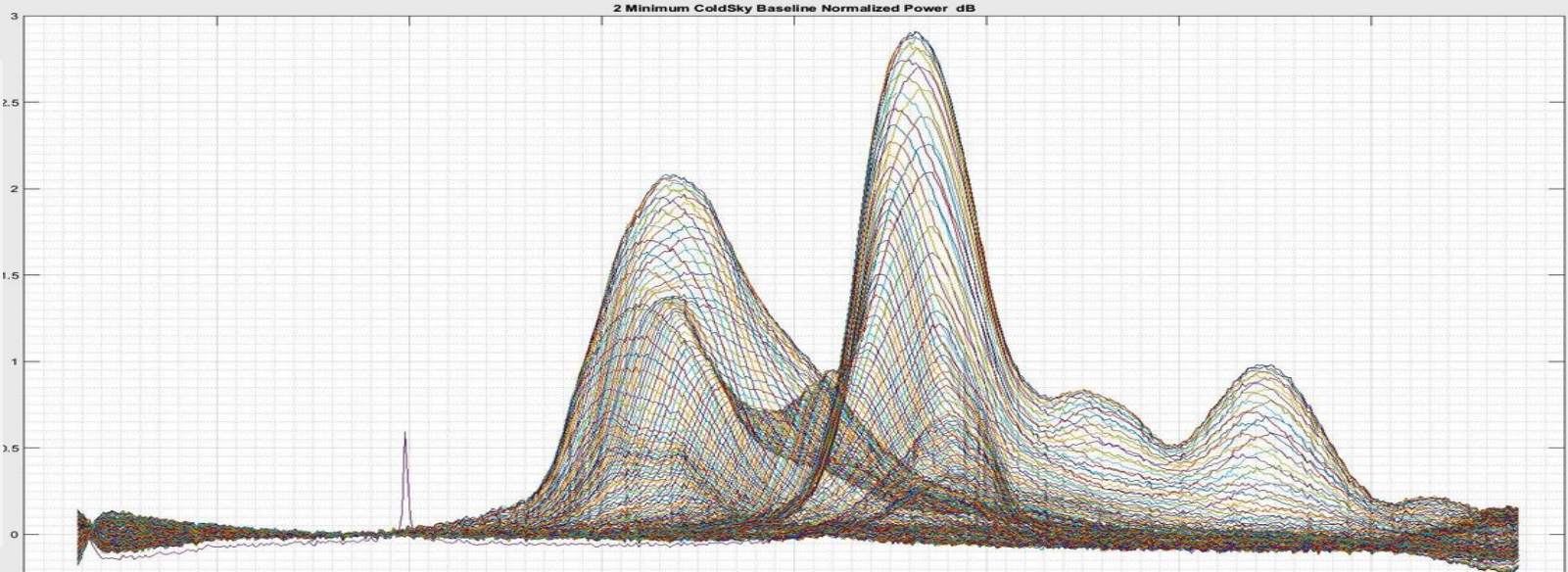
The conversion equation from Power to dB (Decibel) is $\text{dB} = 10 * \text{Log}_{10} (\text{power value})$

As a reference, the normalized Cold_Sky Power Amplitude is set to equal Zero dB

The Vertical Y axis on this graph is labeled : **dB referenced to Cold Sky**

dB referenced to Cold Sky

2 Minimum ColdSky Baseline Normalized Power dB



Examples : *Raw* vs *2 pt mx+b Slope Cold_Sky_Normalization Correction*

PRT 1.2m Dish “~ normal data”

PRT 1.2m Dish added plastic sheet dew shield @ 5-10 hrs

0.75m Disk Yagi high Sun noise bleedover into side lobe

