

Spectral Processing , File Conversion , & Graphics 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.setInitialRaFromString(raStartTextField.getText());
203 308         dataCruncher.rightAscensionCalculator.setRaFormat(RaFormat.RA_FORMAT);
204 309         //raStartTextField.setFormatterFactory(new
205 310         DefaultFormatterFactory(dataCruncher.rightAscensionCalculator.getRaFormat().getFormatter());
206 311         raStartTextField.setText(dataCruncher.rightAscensionCalculator.getRaFormat().getFormatter().format(raStartTextField.getText()));
207 312     });
208 313
209 314     outfileTextField.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
218 323     @Override
219 324     public void insertUpdate(DocumentEvent e) {
220 325
221 326
222 327
223 328
224 329
225 330
226 331
227 332
228 333
229 334
230 335
231 336
232 337
233 338
234 339
235 340
236 341
237 342
238 343
239 344
240 345
241 346
242 347
243 348
244 349
245 350
246 351
247 352
248 353
249 354
250 355
251 356
252 357
253 358
254 359
255 360
256 361
257 362
258 363
259 364
260 365
261 366
262 367
263 368
264 369
265 370
266 371
267 372
268 373
269 374
270 375
271 376
272 377
273 378
274 379
275 380
276 381
277 382
278 383
279 384
280 385
281 386
282 387
283 388
284 389
285 390
286 391
287 392
288 393
289 394
290 395
291 396
292 397
293 398
294 399
295 400
296 401
297 402
298 403
299 404
300 405
301 406
302 407
303 408
304 409
305 410
306 411
307 412
308 413
309 414
310 415
311 416
312 417
313 418
314 419
315 420
316 421
317 422
318 423
319 424
320 425
321 426
322 427
323 428
324 429
325 430
326 431
327 432
328 433
329 434
330 435
331 436
332 437
333 438
334 439
335 440
336 441
337 442
338 443
339 444
340 445
341 446
342 447
343 448
344 449
345 450
346 451
347 452
348 453
349 454
350 455
351 456
352 457
353 458
354 459
355 460
356 461
357 462
358 463
359 464
360 465
361 466
362 467
363 468
364 469
365 470
366 471
367 472
368 473
369 474
370 475
371 476
372 477
373 478
374 479
375 480
376 481
377 482
378 483
379 484
380 485
381 486
382 487
383 488
384 489
385 490
386 491
387 492
388 493
389 494
390 495
391 496
392 497
393 498
394 499
395 500
396 501
397 502
398 503
399 504
400 505
401 506
402 507
403 508
404 509
405 510
406 511
407 512
408 513
409 514
410 515
411 516
412 517
413 518
414 519
415 520
416 521
417 522
418 523
419 524
420 525
421 526
422 527
423 528
424 529
425 530
426 531
427 532
428 533
429 534
430 535
431 536
432 537
433 538
434 539
435 540
436 541
437 542
438 543
439 544
440 545
441 546
442 547
443 548
444 549
445 550
446 551
447 552
448 553
449 554
450 555
451 556
452 557
453 558
454 559
455 560
456 561
457 562
458 563
459 564
460 565
461 566
462 567
463 568
464 569
465 570
466 571
467 572
468 573
469 574
470 575
471 576
472 577
473 578
474 579
475 580
476 581
477 582
478 583
479 584
480 585
481 586
482 587
483 588
484 589
485 590
486 591
487 592
488 593
489 594
490 595
491 596
492 597
493 598
494 599
495 600
496 601
497 602
498 603
499 604
500 605
501 606
502 607
503 608
504 609
505 610
506 611
507 612
508 613
509 614
510 615
511 616
512 617
513 618
514 619
515 620
516 621
517 622
518 623
519 624
520 625
521 626
522 627
523 628
524 629
525 630
526 631
527 632
528 633
529 634
530 635
531 636
532 637
533 638
534 639
535 640
536 641
537 642
538 643
539 644
540 645
541 646
542 647
543 648
544 649
545 650
546 651
547 652
548 653
549 654
550 655
551 656
552 657
553 658
554 659
555 660
556 661
557 662
558 663
559 664
560 665
561 666
562 667
563 668
564 669
565 670
566 671
567 672
568 673
569 674
570 675
571 676
572 677
573 678
574 679
575 680
576 681
577 682
578 683
579 684
580 685
581 686
582 687
583 688
584 689
585 690
586 691
587 692
588 693
589 694
590 695
591 696
592 697
593 698
594 699
595 700
596 701
597 702
598 703
599 704
600 705
601 706
602 707
603 708
604 709
605 710
606 711
607 712
608 713
609 714
610 715
611 716
612 717
613 718
614 719
615 720
616 721
617 722
618 723
619 724
620 725
621 726
622 727
623 728
624 729
625 730
626 731
627 732
628 733
629 734
630 735
631 736
632 737
633 738
634 739
635 740
636 741
637 742
638 743
639 744
640 745
641 746
642 747
643 748
644 749
645 750
646 751
647 752
648 753
649 754
650 755
651 756
652 757
653 758
654 759
655 760
656 761
657 762
658 763
659 764
660 765
661 766
662 767
663 768
664 769
665 770
666 771
667 772
668 773
669 774
670 775
671 776
672 777
673 778
674 779
675 780
676 781
677 782
678 783
679 784
680 785
681 786
682 787
683 788
684 789
685 790
686 791
687 792
688 793
689 794
690 795
691 796
692 797
693 798
694 799
695 800
696 801
697 802
698 803
699 804
700 805
701 806
702 807
703 808
704 809
705 810
706 811
707 812
708 813
709 814
710 815
711 816
712 817
713 818
714 819
715 820
716 821
717 822
718 823
719 824
720 825
721 826
722 827
723 828
724 829
725 830
726 831
727 832
728 833
729 834
730 835
731 836
732 837
733 838
734 839
735 840
736 841
737 842
738 843
739 844
740 845
741 846
742 847
743 848
744 849
745 850
746 851
747 852
748 853
749 854
750 855
751 856
752 857
753 858
754 859
755 860
756 861
757 862
758 863
759 864
760 865
761 866
762 867
763 868
764 869
765 870
766 871
767 872
768 873
769 874
770 875
771 876
772 877
773 878
774 879
775 880
776 881
777 882
778 883
779 884
780 885
781 886
782 887
783 888
784 889
785 890
786 891
787 892
788 893
789 894
790 895
791 896
792 897
793 898
794 899
795 900
796 901
797 902
798 903
799 904
800 905
801 906
802 907
803 908
804 909
805 910
806 911
807 912
808 913
809 914
810 915
811 916
812 917
813 918
814 919
815 920
816 921
817 922
818 923
819 924
820 925
821 926
822 927
823 928
824 929
825 930
826 931
827 932
828 933
829 934
830 935
831 936
832 937
833 938
834 939
835 940
836 941
837 942
838 943
839 944
840 945
841 946
842 947
843 948
844 949
845 950
846 951
847 952
848 953
849 954
850 955
851 956
852 957
853 958
854 959
855 960
856 961
857 962
858 963
859 964
860 965
861 966
862 967
863 968
864 969
865 970
866 971
867 972
868 973
869 974
870 975
871 976
872 977
873 978
874 979
875 980
876 981
877 982
878 983
879 984
880 985
881 986
882 987
883 988
884 989
885 990
886 991
887 992
888 993
889 994
890 995
891 996
892 997
893 998
894 999
895 1000
896 1001
897 1002
898 1003
899 1004
900 1005
901 1006
902 1007
903 1008
904 1009
905 1010
906 1011
907 1012
908 1013
909 1014
910 1015
911 1016
912 1017
913 1018
914 1019
915 1020
916 1021
917 1022
918 1023
919 1024
920 1025
921 1026
922 1027
923 1028
924 1029
925 1030
926 1031
927 1032
928 1033
929 1034
930 1035
931 1036
932 1037
933 1038
934 1039
935 1040
936 1041
937 1042
938 1043
939 1044
940 1045
941 1046
942 1047
943 1048
944 1049
945 1050
946 1051
947 1052
948 1053
949 1054
950 1055
951 1056
952 1057
953 1058
954 1059
955 1060
956 1061
957 1062
958 1063
959 1064
960 1065
961 1066
962 1067
963 1068
964 1069
965 1070
966 1071
967 1072
968 1073
969 1074
970 1075
971 1076
972 1077
973 1078
974 1079
975 1080
976 1081
977 1082
978 1083
979 1084
980 1085
981 1086
982 1087
983 1088
984 1089
985 1090
986 1091
987 1092
988 1093
989 1094
990 1095
991 1096
992 1097
993 1098
994 1099
995 1100
996 1101
997 1102
998 1103
999 1104
1000 1105
1001 1106
1002 1107
1003 1108
1004 1109
1005 1110
1006 1111
1007 1112
1008 1113
1009 1114
1010 1115
1011 1116
1012 1117
1013 1118
1014 1119
1015 1120
1016 1121
1017 1122
1018 1123
1019 1124
1020 1125
1021 1126
1022 1127
1023 1128
1024 1129
1025 1130
1026 1131
1027 1132
1028 1133
1029 1134
1030 1135
1031 1136
1032 1137
1033 1138
1034 1139
1035 1140
1036 1141
1037 1142
1038 1143
1039 1144
1040 1145
1041 1146
1042 1147
1043 1148
1044 1149
1045 1150
1046 1151
1047 1152
1048 1153
1049 1154
1050 1155
1051 1156
1052 1157
1053 1158
1054 1159
1055 1160
1056 1161
1057 1162
1058 1163
1059 1164
1060 1165
1061 1166
1062 1167
1063 1168
1064 1169
1065 1170
1066 1171
1067 1172
1068 1173
1069 1174
1070 1175
1071 1176
1072 1177
1073 1178
1074 1179
1075 1180
1076 1181
1077 1182
1078 1183
1079 1184
1080 1185
1081 1186
1082 1187
1083 1188
1084 1189
1085 1190
1086 1191
1087 1192
1088 1193
1089 1194
1090 1195
1091 1196
1092 1197
1093 1198
1094 1199
1095 1200
1096 1201
1097 1202
1098 1203
1099 1204
1100 1205
1101 1206
1102 1207
1103 1208
1104 1209
1105 1210
1106 1211
1107 1212
1108 1213
1109 1214
1110 1215
1111 1216
1112 1217
1113 1218
1114 1219
1115 1220
1116 1221
1117 1222
1118 1223
1119 1224
1120 1225
1121 1226
1122 1227
1123 1228
1124 1229
1125 1230
1126 1231
1127 1232
1128 1233
1129 1234
1130 1235
1131 1236
1132 1237
1133 1238
1134 1239
1135 1240
1136 1241
1137 1242
1138 1243
1139 1244
1140 1245
1141 1246
1142 1247
1143 1248
1144 1249
1145 1250
1146 1251
1147 1252
1148 1253
1149 1254
1150 1255
1151 1256
1152 1257
1153 1258
1154 1259
1155 1260
1156 1261
1157 1262
1158 1263
1159 1264
1160 1265
1161 1266
1162 1267
1163 1268
1164 1269
1165 1270
1166 1271
1167 1272
1168 1273
1169 1274
1170 1275
1171 1276
1172 1277
1173 1278
1174 1279
1175 1280
1176 1281
1177 1282
1178 1283
1179 1284
1180 1285
1181 1286
1182 1287
1183 1288
1184 1289
1185 1290
1186 1291
1187 1292
1188 1293
1189 1294
1190 1295
1191 1296
1192 1297
1193 1298
1194 1299
1195 1300
1196 1301
1197 1302
1198 1303
1199 1304
1200 1305
1201 1306
1202 1307
1203 1308
1204 1309
1205 1310
1206 1311
1207 1312
1208 1313
1209 1314
1210 1315
1211 1316
1212 1317
1213 1318
1214 1319
1215 1320
1216 1321
1217 1322
1218 1323
1219 1324
1220 1325
1221 1326
1222 1327
1223 1328
1224 1329
1225 1330
1226 1331
1227 1332
1228 1333
1229 1334
1230 1335
1231 1336
1232 1337
1233 1338
1234 1339
1235 1340
1236 1341
1237 1342
1238 1343
1239 1344
1240 1345
1241 1346
1242 1347
1243 1348
1244 1349
1245 1350
1246 1351
1247 1352
1248 1353
1249 1354
1250 1355
1251 1356
1252 1357
1253 1358
1254 1359
1255 1360
1256 1361
1257 1362
1258 1363
1259 1364
1260 1365
1261 1366
1262 1367
1263 1368
1264 1369
1265 1370
1266 1371
1267 1372
1268 1373
1269 1374
1270 1375
1271 1376
1272 1377
1273 1378
1274 1379
1275 1380
1276 1381
1277 1382
1278 1383
1279 1384
1280 1385
1281 1386
1282 1387
1283 1388
1284 1389
1285 1390
1286 1391
1287 1392
1288 1393
1289 1394
1290 1395
1291 1396
1292 1397
1293 1398
1294 1399
1295 1400
1296 1401
1297 1402
1298 1403
1299 1404
1300 1405
1301 1406
1302 1407
1303 1408
1304 1409
1305 1410
1306 1411
1307 1412
1308 1413
1309 1414
1310 1415
1311 1416
1312 1417
1313 1418
1314 1419
1315 1420
1316 1421
1317 1422
1318 1423
1319 1424
1320 1425
1321 1426
1322 1427
1323 1428
1324 1429
1325 1430
1326 1431
1327 1432
1328 1433
1329 1434
1330 1435
1331 1436
1332 1437
1333 1438
1334 1439
1335 1440
1336 1441
1337 1442
1338 1443
1339 1444
1340 1445
1341 1446
1342 1447
1343 1448
1344 1449
1345 1450
1346 1451
1347 1452
1348 1453
1349 1454
1350 1455
1351 1456
1352 1457
1353 1458
1354 1459
1355 1460
1356 1461
1357 1462
1358 1463
1359 1464
1360 1465
1361 1466
1362 1467
1363 1468
1364 1469
1365 1470
1366 1471
1367 1472
1368 1473
1369 1474
1370 1475
1371 1476
1372 1477
1373 1478
1374 1479
1375 1480
1376 1481
1377 1482
1378 1483
1379 1484
1380 1485
1381 1486
1382 1487
1383 1488
1384 1489
1385 1490
1386 1491
1387 1492
1388 1493
1389 1494
1390 1495
1391 1496
1392 1497
1393 1498
1394 1499
1395 1500
1396 1501
1397 1502
1398 1503
1399 1504
1400 1505
1401 1506
1402 1507
1403 1508
1404 1509
1405 1510
1406 1511
1407 1512
1408 1513
1409 1514
1410 1515
1411 1516
1412 1517
1413 1518
1414 1519
1415 1520
1416 1521
1417 1522
1418 1523
1419 1524
1420 1525
1421 1526
1422 1527
1423 1528
1424 1529
1425 1530
1426 1531
1427 1532
1428 1533
1429 1534
1430 1535
1431 1536
1432 1537
1433 1538
1434 1539
1435 1540
1436 1541
1437 1542
1438 1543
1439 1544
1440 1545
1441 1546
1442 1547
1443 1548
1444 1549
1445 1550
1446 1551
1447 1552
1448 1553
1449 1554
1450 1555
1451 1556
1452 1557
1453 1558
1454 1559
1455 1560
1456 1561
1457 1562
1458 1563
1459 1564
1460 1565
1461 1566
1462 1567
1463 1568
1464 1569
1465 1570
1466 1571
1467 1572
1468 1573
1469 1574
1470 1575
1471 1576
1472 1577
1473 1578
1474 1579
1475 1580
1476 1581
1477 1582
1478 1583
1479 1584
1480 1585
1481 1586
1482 1587
1483 1588
1484 1589
1485 1590
1486 1591
1487 1592
1488 1593
1489 1594
1490 1595
1491 1596
1492 1597
1493 1598
1494 1599
1495 1600
1496 1601
1497 1602
1498 1603
1499 1604
1500 1605
1501 1606
1502 1607
1503 1608
1504 1609
1505 1610
1506 1611
1507 1612
1508 1613
1509 1614
1510 1615
1511 1616
1512 1617
1513 1618
1514 1619
1515 1620
1516 1621
1517 1622
1518 1623
1519 1624
1520 1625
1521 1626
1522 1627
1523 1628
1524 1629
1525 1630
1526 1631
1527 1632
1528 1633
1529 1634
1530 1635
1531 1636
1532 1637
1533 1638
1534 1639
1535 1640
1536 1641
1537 1642
1538 1643
1539 1644
1540 1645
1541 1646
1542 1647
1543 1648
1544 1649
1545 1650
1546 1651
1547 1652
1548 1653
1549 1654
1550 1655
1551 1656
1552 1657
1553 1658
1554 1659
1555 1660
1556 166
```

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/>

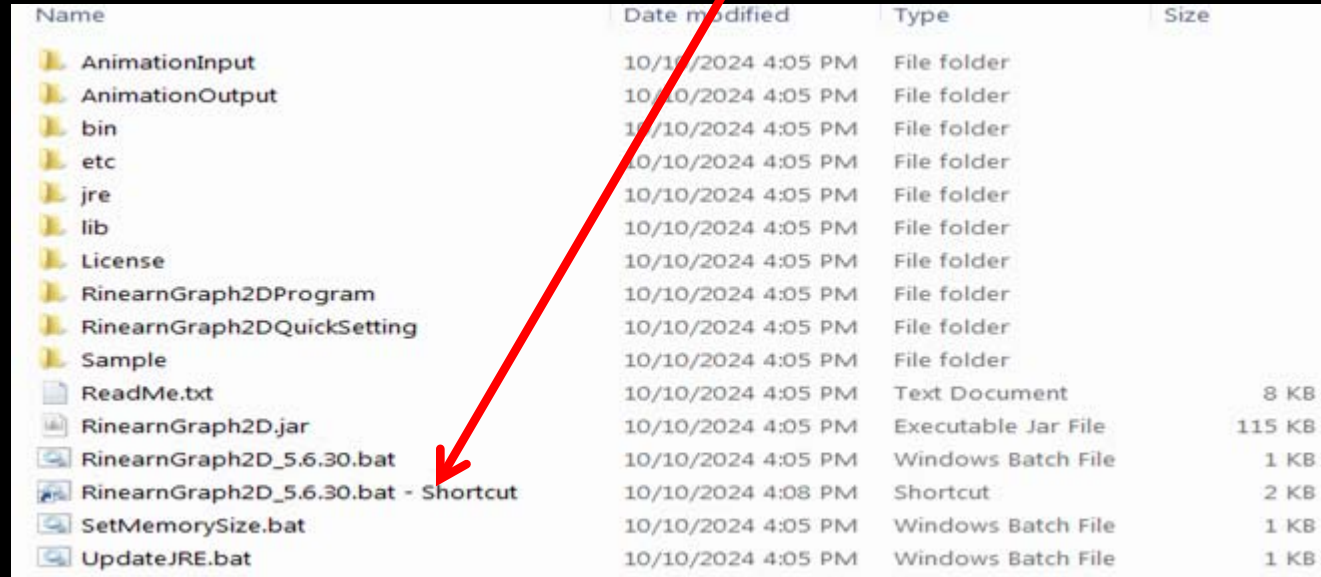
<https://www.rinearn.com/en-us/graph3d/>

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

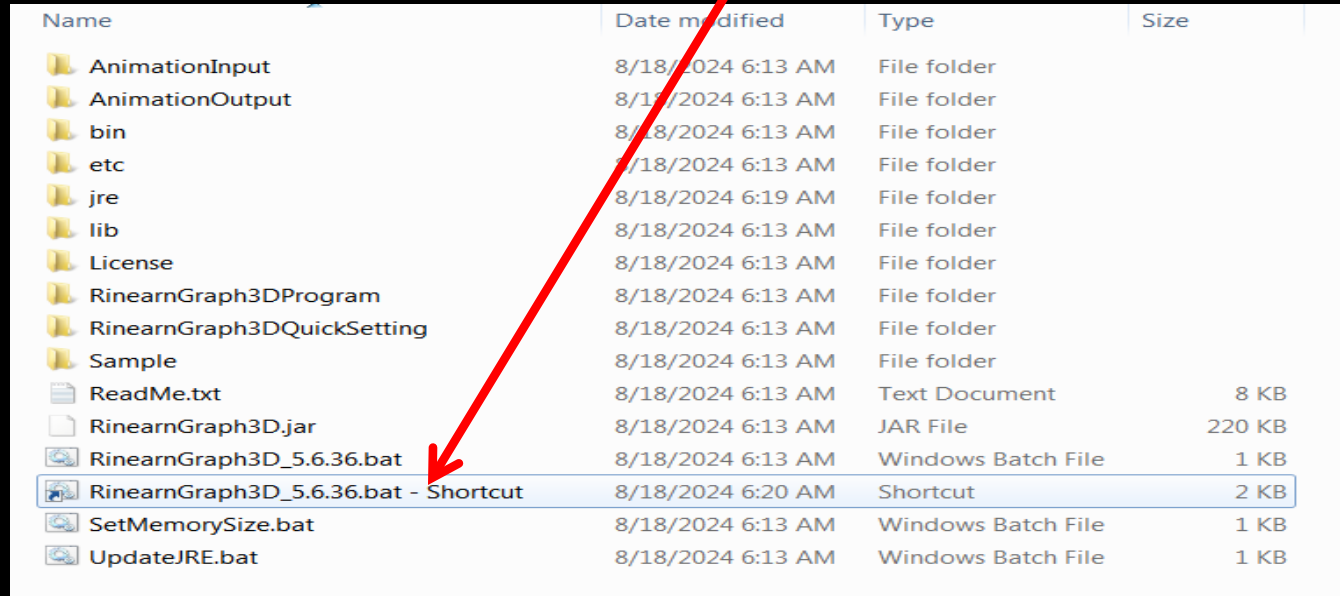


Name	Date modified	Type	Size
AnimationInput	10/10/2024 4:05 PM	File folder	
AnimationOutput	10/10/2024 4:05 PM	File folder	
bin	10/10/2024 4:05 PM	File folder	
etc	10/10/2024 4:05 PM	File folder	
jre	10/10/2024 4:05 PM	File folder	
lib	10/10/2024 4:05 PM	File folder	
License	10/10/2024 4:05 PM	File folder	
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

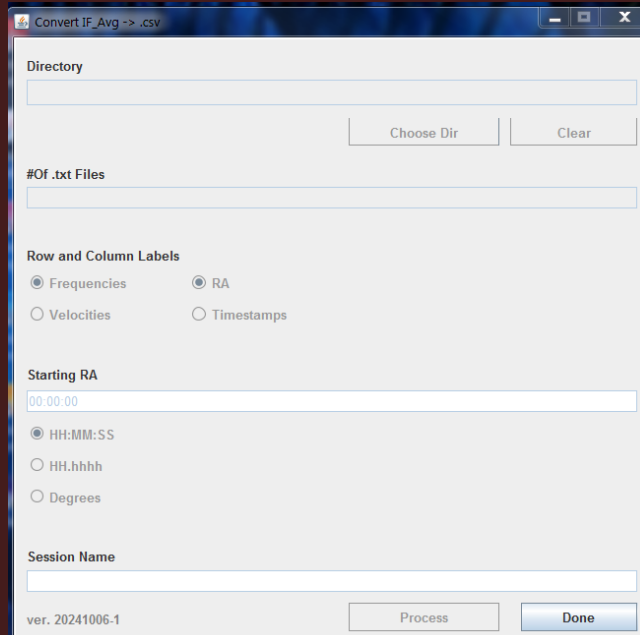
Jamison Adcock : JA_IFAvg2CSV.jar Processing Software Installation

JA_IFAvg2csv.jar :

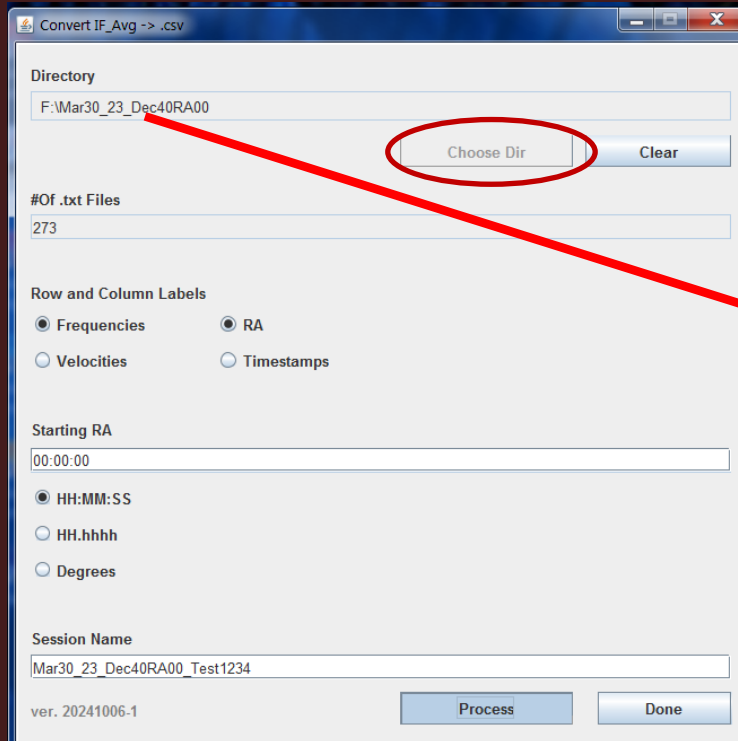
Conversion of a subdirectory data set of IF_Ave *.txt files to Rinearn compatible *.csv

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

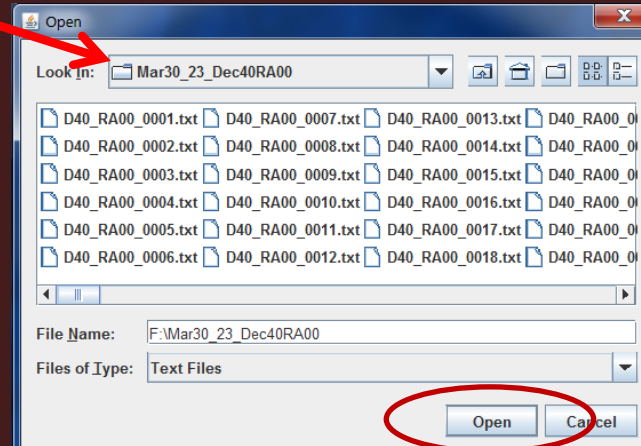
download Latest Rev of JA_IFAvg2csv_.jar and drag to Desktop



JA_IFAvg2CSV.jar Processing Software Guide



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



JA_IFAvg2CSV.jar Processing Software Guide

Convert IF_Avg -> .csv

Directory
F:\Mar30_23_Dec40RA00
Choose Dir Clear

#Of .txt Files
273

Row and Column Labels
☒ Frequencies ☒ RA
☐ Velocities ☐ Timestamps

Starting RA
00:00:00
☒ HH:MM:SS
☐ HH.hhhh
☐ Degrees

Session Name
Mar30_23_Dec40RA00_Test1234

ver. 20241006-1 Process Done

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

JA_IFAvg2CSV.jar Processing Software Guide

Convert IF_Avg -> .csv

Directory
F:\Mar30_23_Dec40RA00

Choose Dir Clear

#Of .txt Files
273

Row and Column Labels
☒ Frequencies ☒ RA
☐ Velocities ☐ Timestamps

Starting RA
00:00:00

☒ HH:MM:SS
☐ HH.hhhh
☐ Degrees

Session Name
Mar30_23_Dec40RA00_Test1234

ver. 20241006-1

Process Done

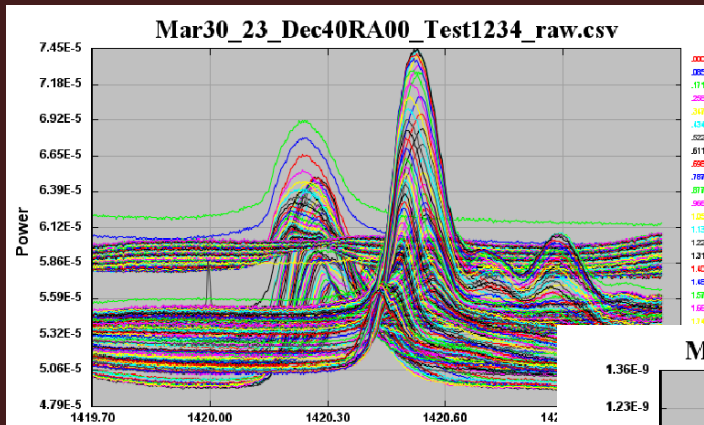
Message
Successfully wrote out .csv files
OK

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

Computer > USB20FD (F:) > Mar30_23_Dec40RA00

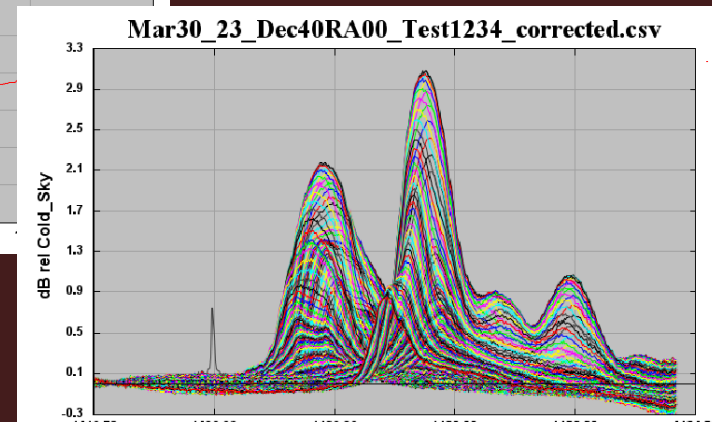
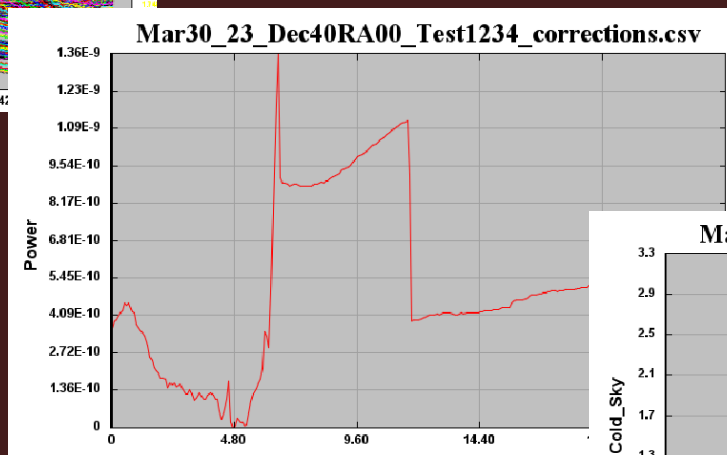
Mar30_23_Dec40RA00_Test1234_corrected.csv	10/10/2024 4:21 PM	2,808 KB	Microsoft Office Excel Comma Separated Values
Mar30_23_Dec40RA00_Test1234_corrections.csv	10/10/2024 4:21 PM	10 KB	Microsoft Office Excel Comma Separated Values
Mar30_23_Dec40RA00_Test1234_raw.csv	10/10/2024 4:21 PM	1,361 KB	Microsoft Office Excel Comma Separated Values

JA_IFAvg2CSV.jar Processing Software Workflow

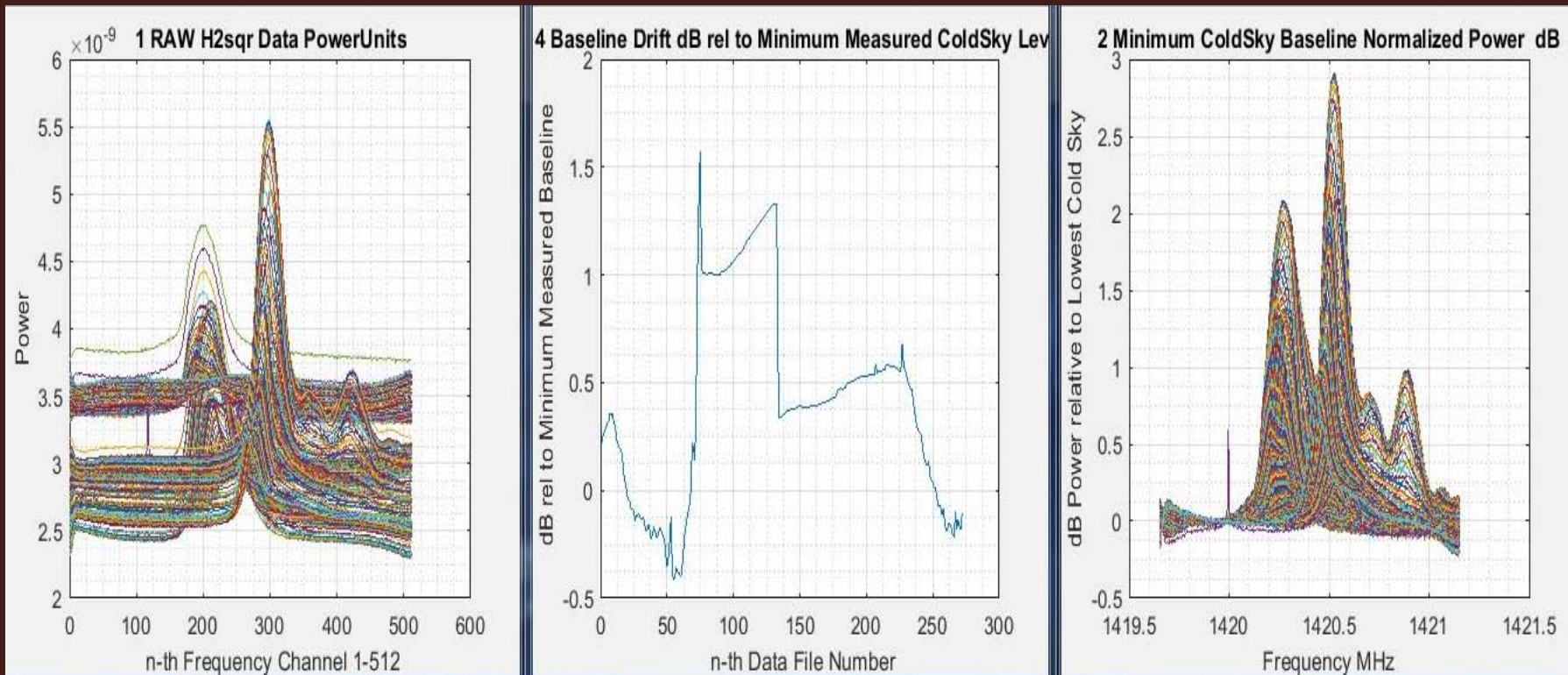


Computer > USB20FD (F:) > Mar30_23_Dec40RA00

Mar30_23_Dec40RA00_Test1234_corrected.csv	10/10/2024 4:21 PM	2,808 KB	Microsoft Office Excel Comma Separated Values
Mar30_23_Dec40RA00_Test1234_corrections.csv	10/10/2024 4:21 PM	10 KB	Microsoft Office Excel Comma Separated Values
Mar30_23_Dec40RA00_Test1234_raw.csv	10/10/2024 4:21 PM	1,361 KB	Microsoft Office Excel Comma Separated Values

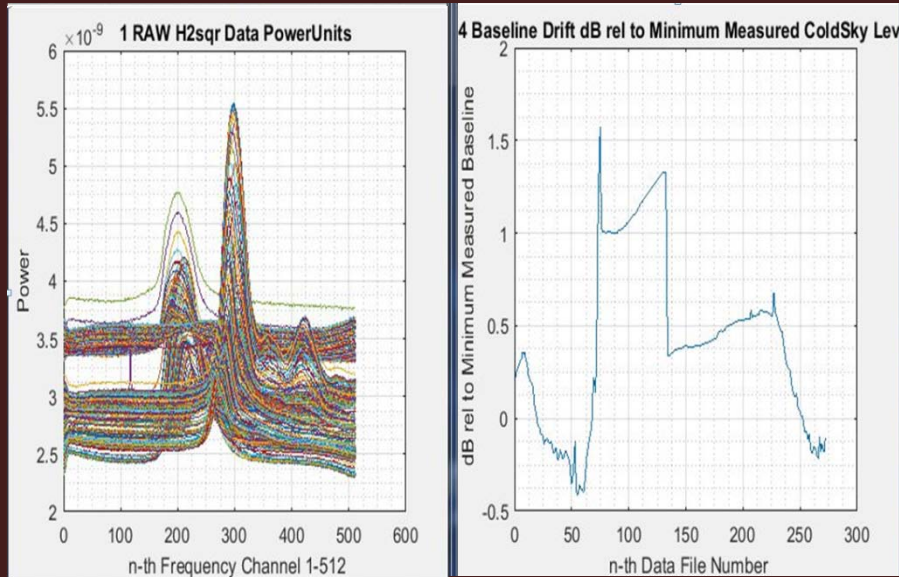


JA_IFAvg2CSV.jar Processing Workflow



JA_IFAvg2CSV.jar Processing Workflow

“ Cold Sky ” Background Drift Correction

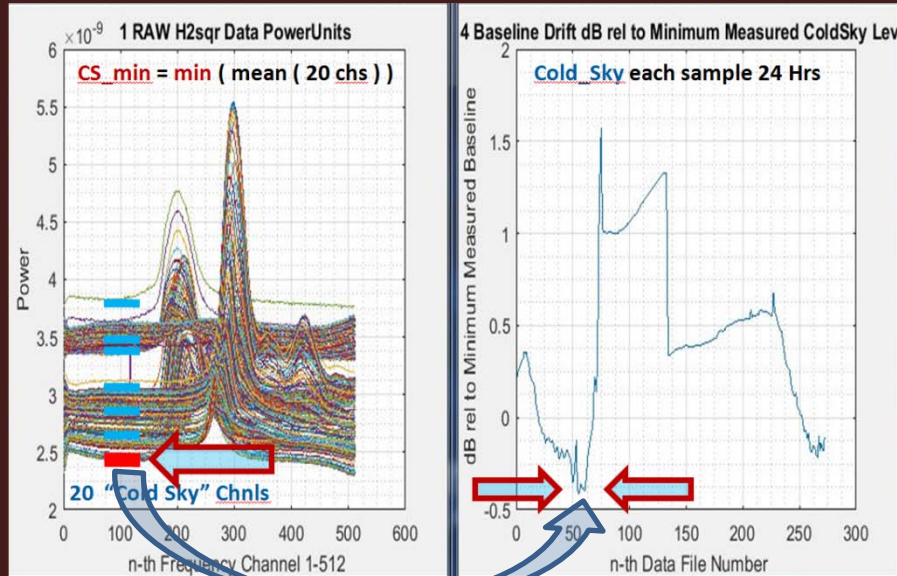


During the time period in which spectral data is being acquired, many factors may cause an overall background level shift ...

- 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

JA_IFAvg2CSV.jar Processing Workflow

“Cold Sky” Background Drift Correction



Lowest Amplitude = Drift Correction Reference

The Background Drift can be measured and plotted.

Step #1 Specify a small frequency range lower 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**.

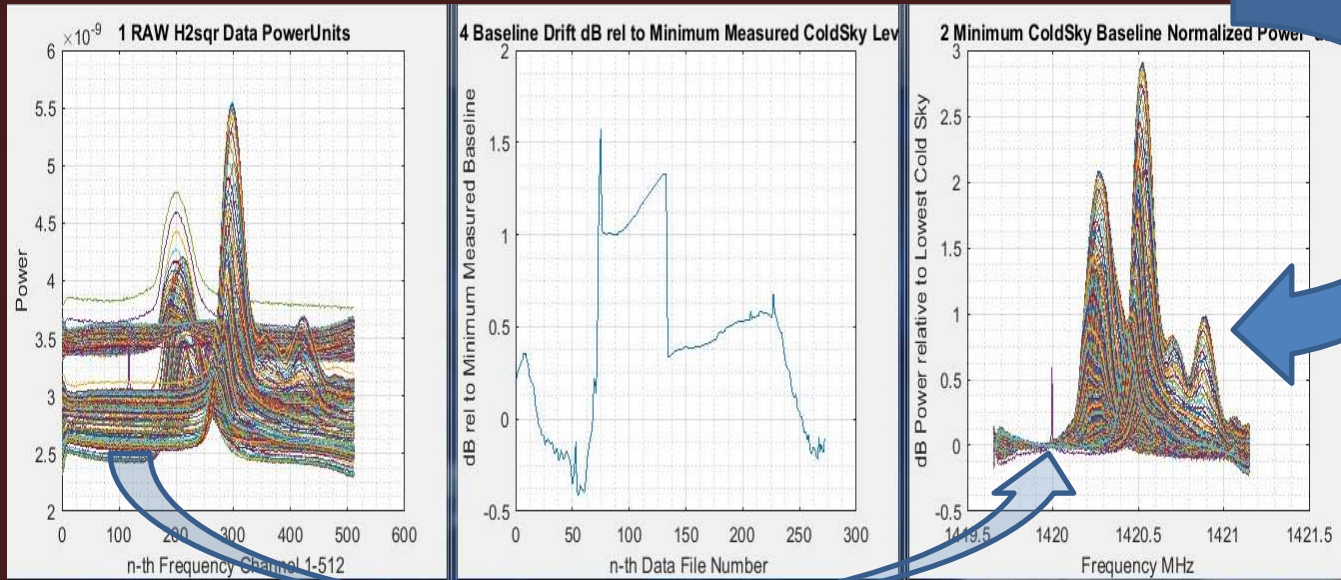
Step#3 For each spectra, calculate the difference in amplitude between its average value over the drift correction frequency range and the Reference, and subtract that from all values in that spectrum

Step#4 Repeat that for each of the spectra.

JA_IFAvg2CSV.jar Processing Workflow

“Cold Sky” Background Drift Correction

Step#4 Repeat that for each of the spectra.



“Cold-Sky” Drift Corrected Spectrum Set

“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 $\text{dB} = 10 * \text{Log}_{10} (\text{power value})$

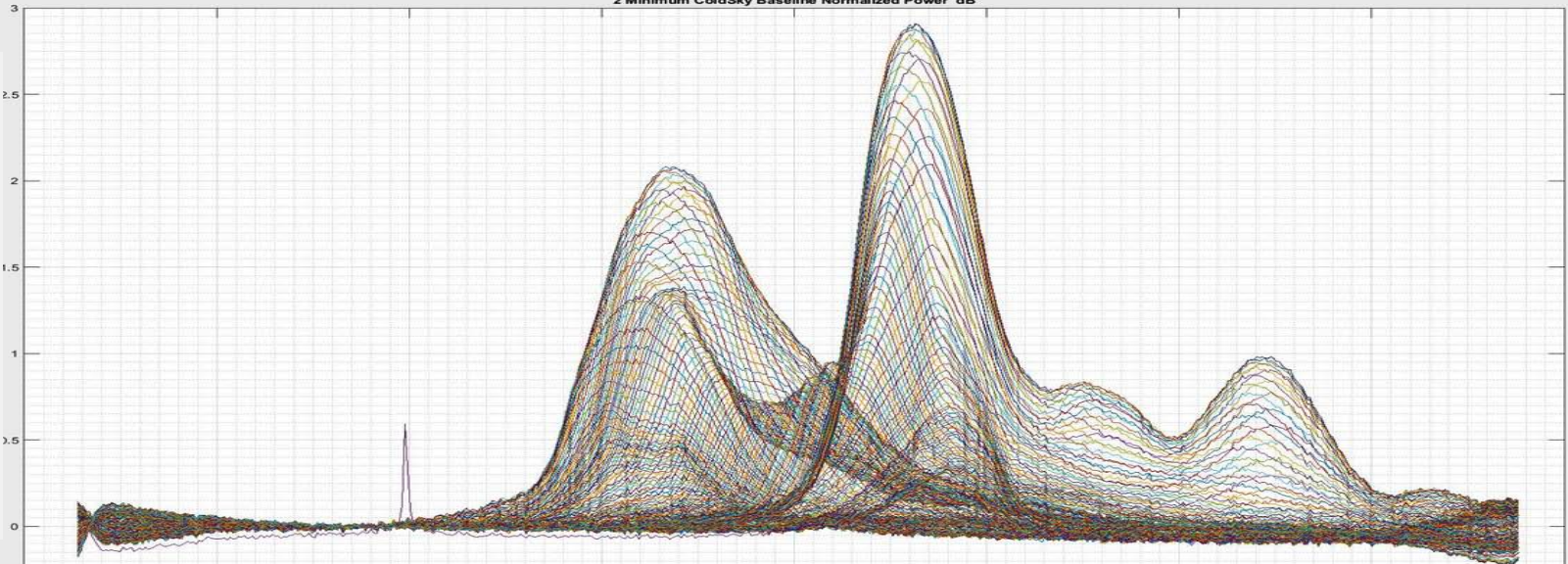
As a reference, the normalized Cold_Sky Power Amplitude is set to equal Zero dB

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

dB referenced to Cold Sky

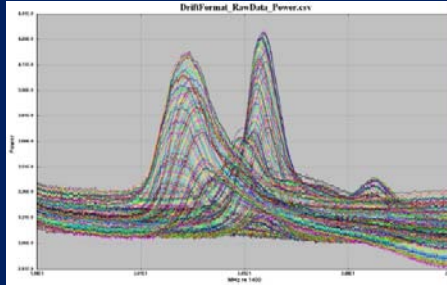
2 Minimum ColdSky Baseline Normalized Power dB

2 Minimum ColdSky Baseline Normalized Power dB

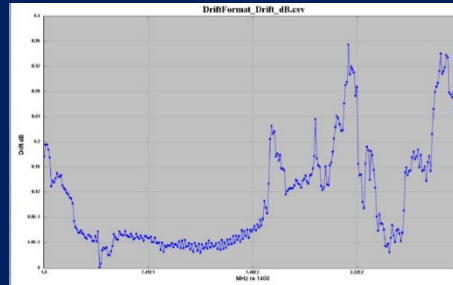


Rinearn (2D) & 3D Graphics Software Guide

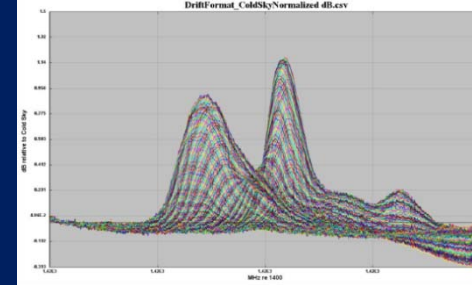
Raw Data Spectrum Set



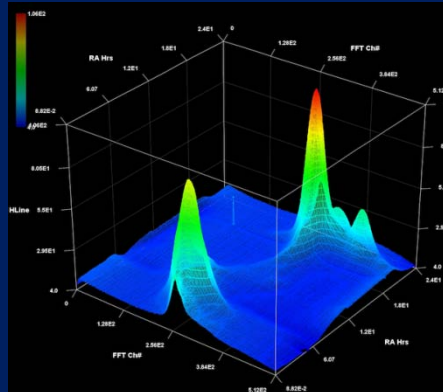
Background Drift



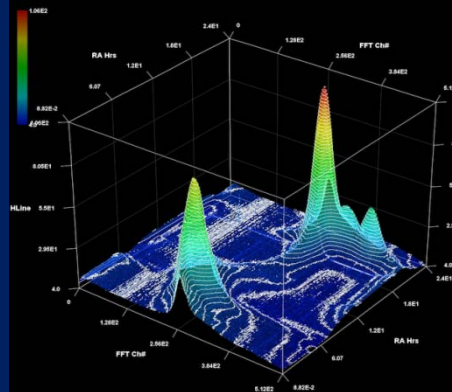
Corrected Data Normalized to Cold Sky in dB



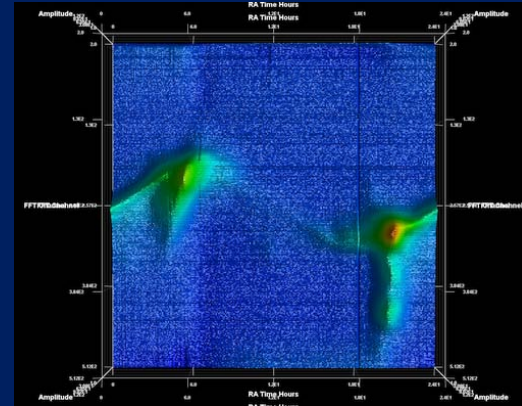
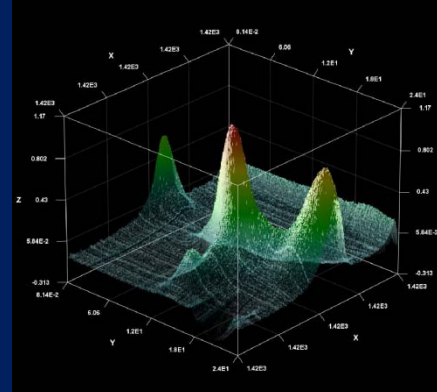
H_Line Data Set



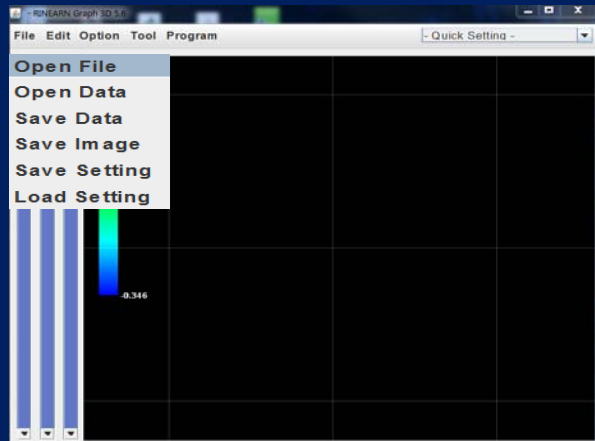
24 Hour Drift Scan



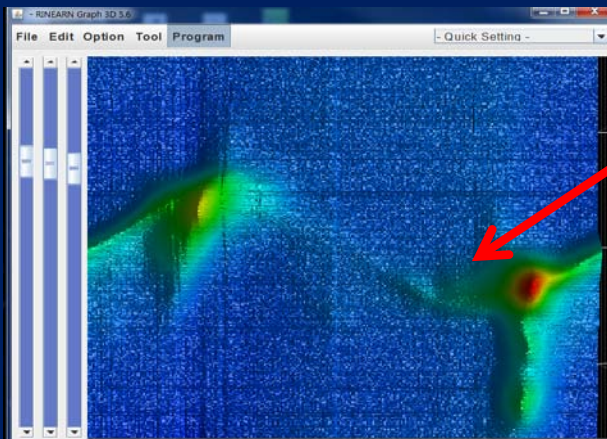
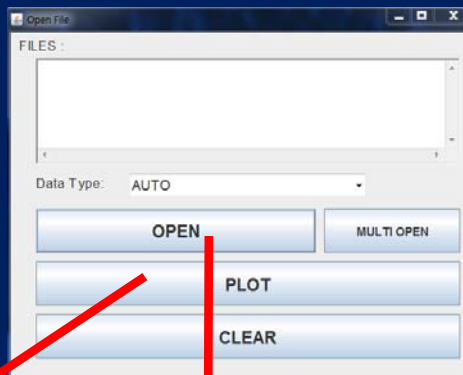
@ Declination + 40°



Rinearn 3D Software Guide

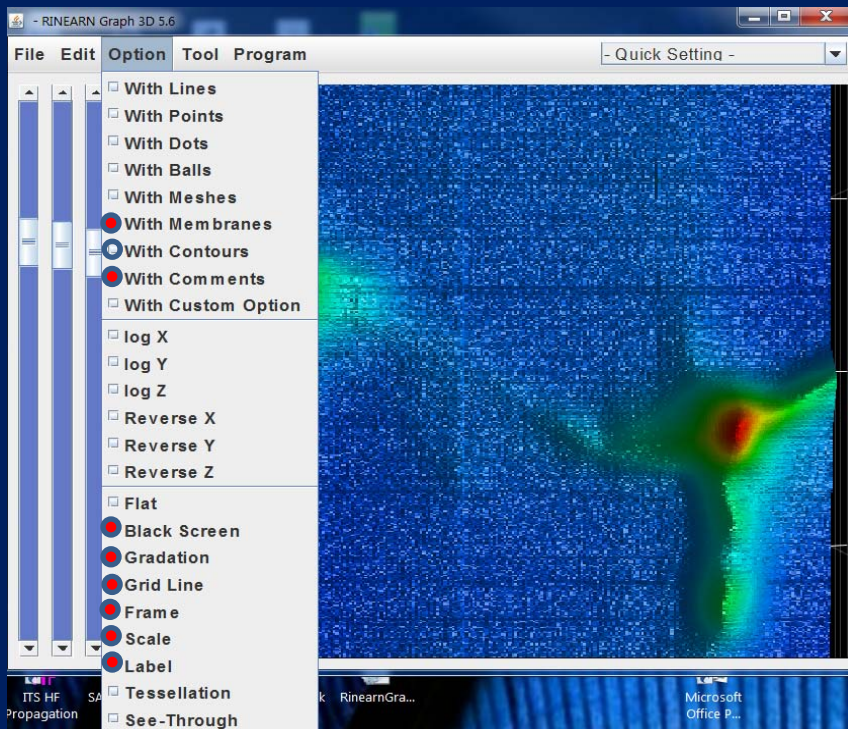


Open File : OPEN (locate *.CSV file), Select , PLOT

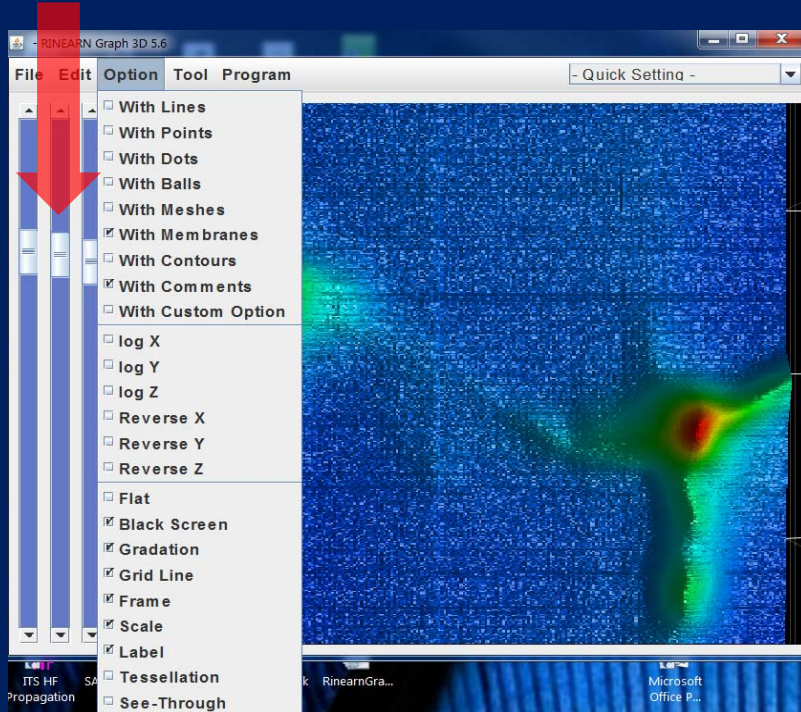


D40_RA00_0272.txt	3/31/2023 12:50 PM	Text Document	15 KB
D40_RA00_0273.txt	3/31/2023 12:55 PM	Text Document	15 KB
D40_RA00_0273.zip	9/28/2023 10:34 AM	Compressed (zipped)...	962 KB
Mar30_23_Dec40RA00_2D_corrected.csv	10/2/2024 10:08 AM	Microsoft Office Exce...	2,809 KB
Mar30_23_Dec40RA00_2D_corrections.csv	10/2/2024 10:08 AM	Microsoft Office Exce...	11 KB
Mar30_23_Dec40RA00_2D_raw.csv	Type: Microsoft Office Excel Comma Separated Values File Size: 2.74 MB	ce...	1,362 KB
Mar30_23_Dec40RA00_JA06Oct_correc	Date modified: 10/2/2024 10:08 AM	ce...	1,572 KB
Mar30_23_Dec40RA00_JA06Oct_corrections.csv	10/6/2024 6:08 AM	Microsoft Office Exce...	7 KB

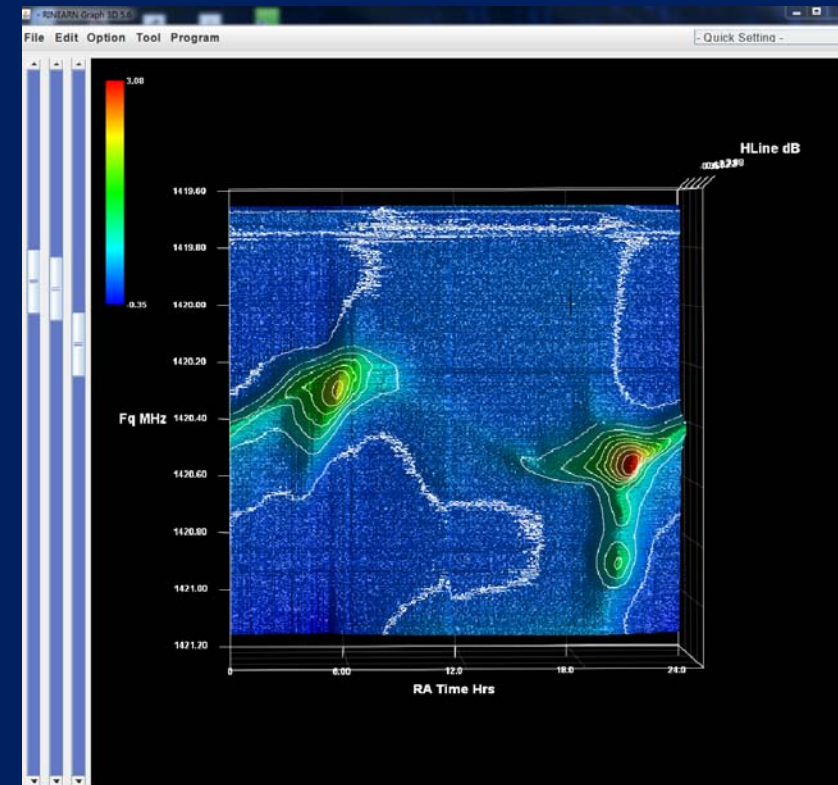
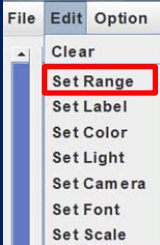
Option panel : typical selections



Sliders Change the Size of the Displayed Plot



Edit / Set Range



Disable all 'Auto' options

Select 'Else' and enter formats as shown below to properly label frequencies & Time

Set **max min** to round numbers for better labeling

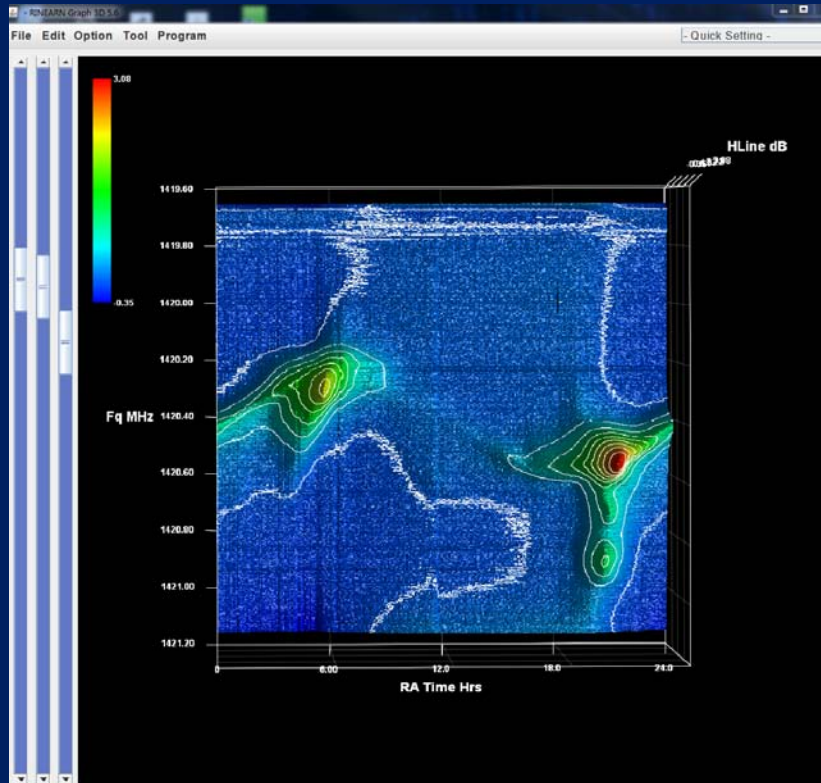
The 'Set Range' dialog box contains the following settings:

- X Axis -**
 - ☒ Auto Ranging
 - X-max: 1421.2
 - X-min: 1419.6
- Y Axis -**
 - ☒ Auto Ranging
 - Y-max: 24.0
 - Y-min: 0.0
- Z Axis -**
 - ☒ Auto Ranging
 - Z-max: 3.080445463
 - Z-min: -0.346393353

A large 'SET' button is located at the bottom of the dialog.

Edit / Set Label

Label the X Y Z axes as appropriate

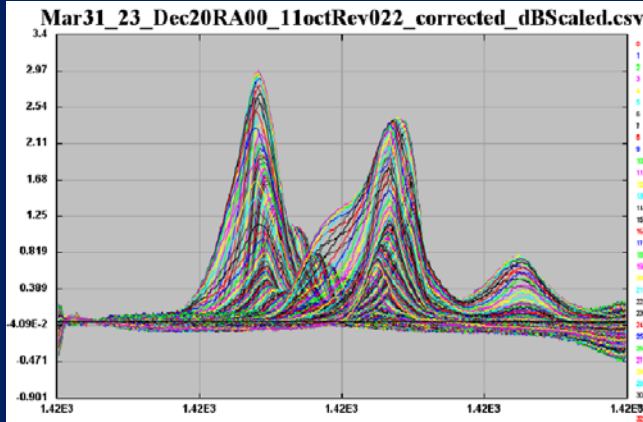
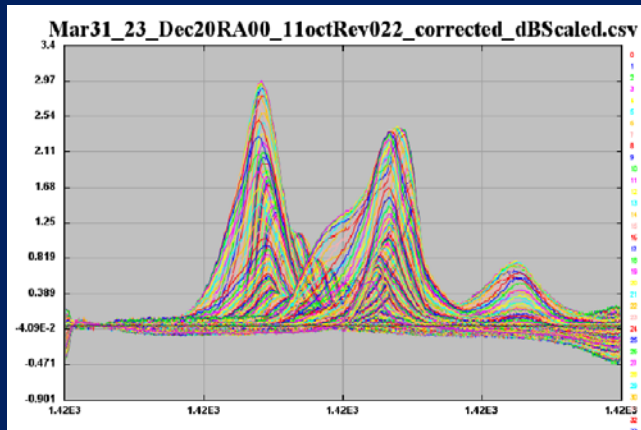
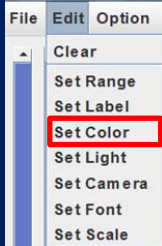


The 'Set Label' dialog box is shown, allowing users to label the X, Y, and Z axes. The X-axis is labeled 'Freq MHz', the Y-axis is labeled 'FileFrame No', and the Z-axis is labeled 'H Line dB'. A 'SET' button is at the bottom.

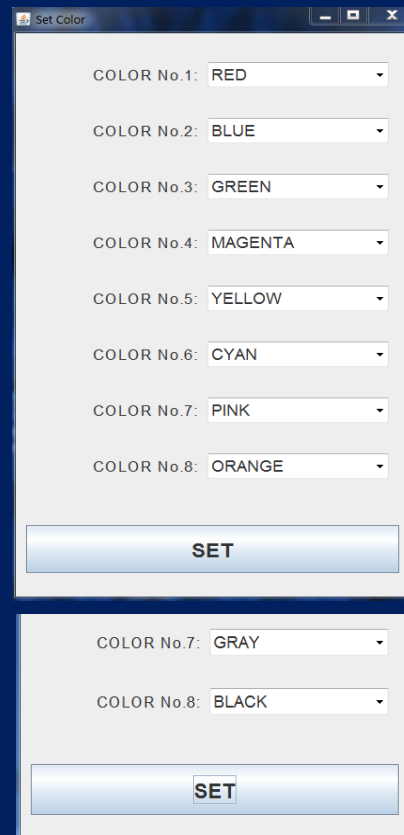
Axis	Label
- X Axis -	Freq MHz
- Y Axis -	FileFrame No
- Z Axis -	H Line dB

SET

Edit / Set Color



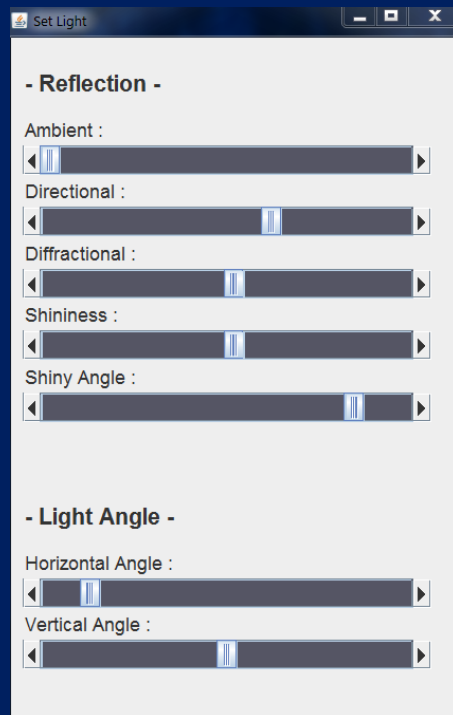
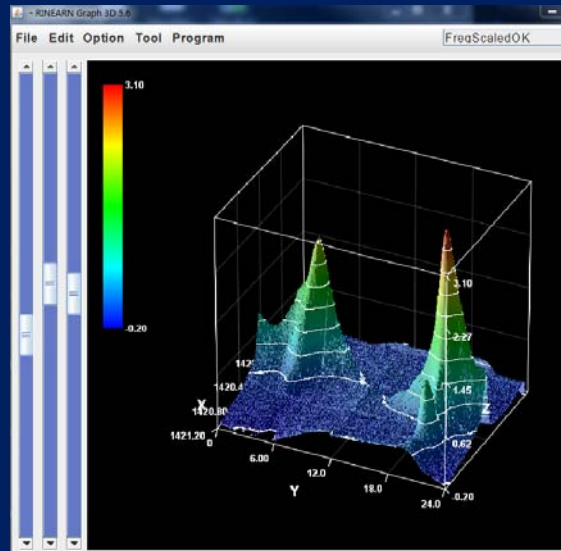
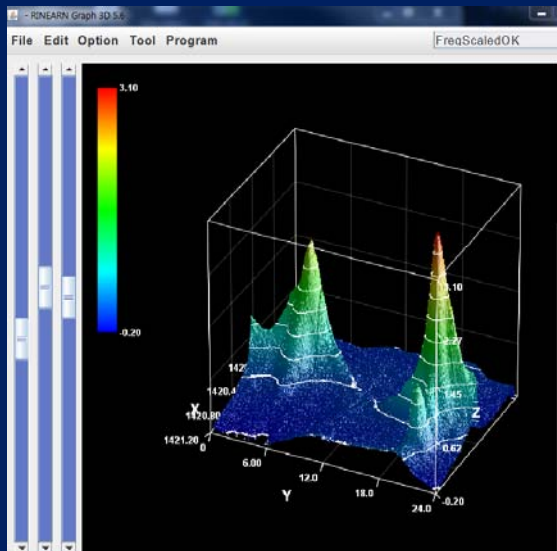
Color Settings are useful for **2D** graphics,
But seem to have no effect on the **3D** display



Clear
Set Range
Set Label
Set Color
Set Light
Set Camera
Set Font
Set Scale

Edit / Set Light

This is an interesting set of 3D display controls
Experiment !



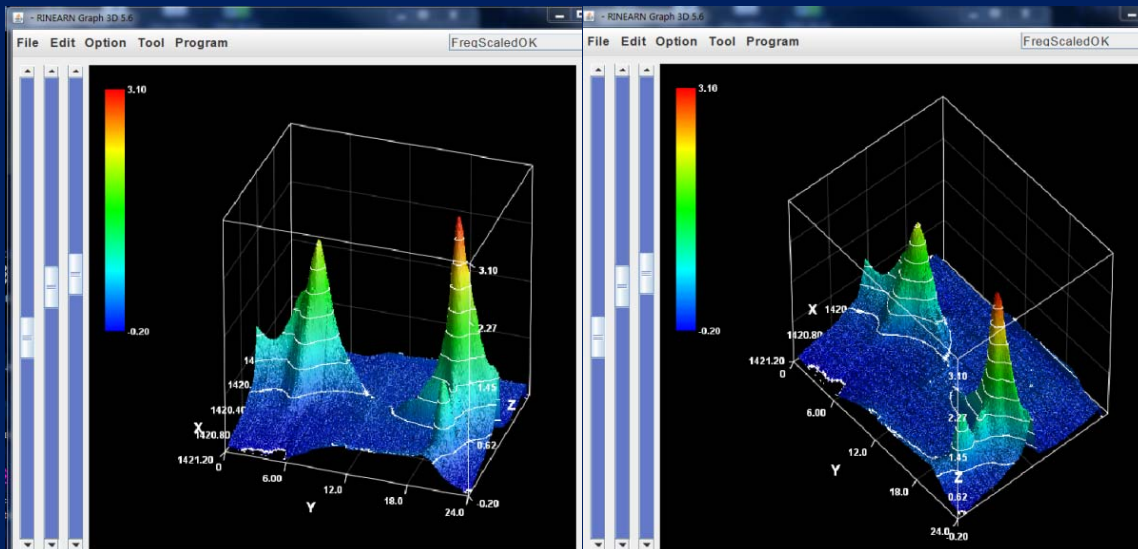


Edit / Camera

Camera set the

Viewing Position from which the 3D Graph is seen

Try different options



Set Camera

- Camera Angle -

Horizontal Angle [rad] :

Vertical Angle [rad] :

Zenith Axis :

- Camera Distance -

Camera Distance :

Magnification :

☒ Perspective

- Screen -

Center offset X [pixel] :

Center offset Y [pixel] :

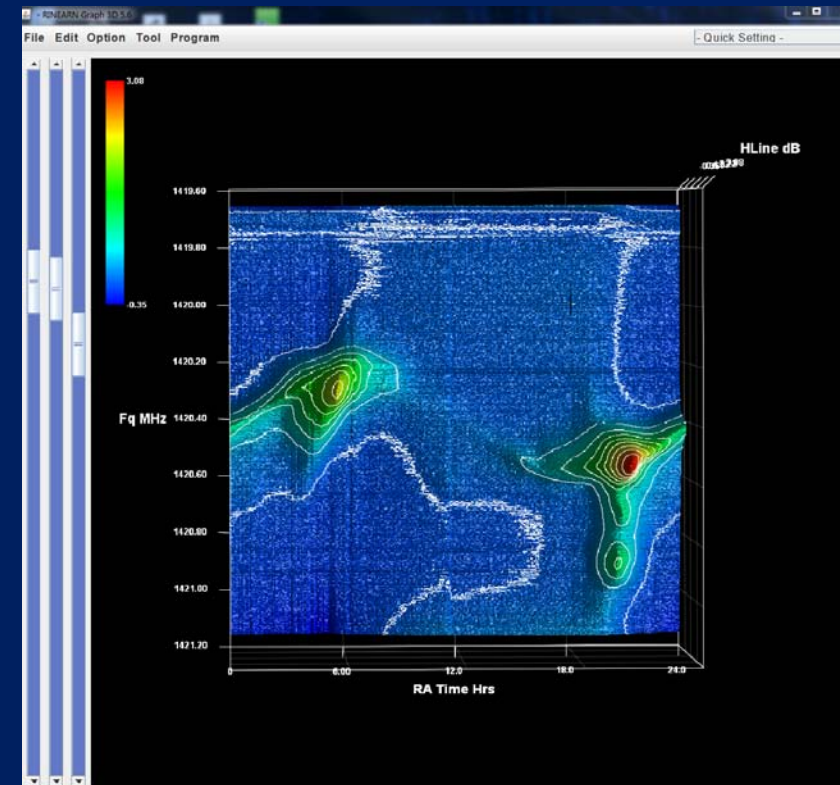
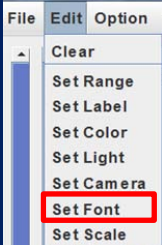
Width Height

☒ High Quality Rendering (Antialiasing)

SET

Edit / Set Font

Select **Font** parameters as you wish .



Select Fonts

Set Font

- Scale Font -

☒ Bold

Font Name: - Default -

Font Size: 12

- Label Font -

☒ Bold

Font Name: - Default -

Font Size: 18

- Comment Font -

☒ Bold

Font Name: - Default -

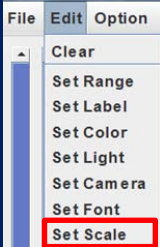
Font Size: 12

- Marker Font -

Font Name: - Default -

SET

Edit / Set Scale

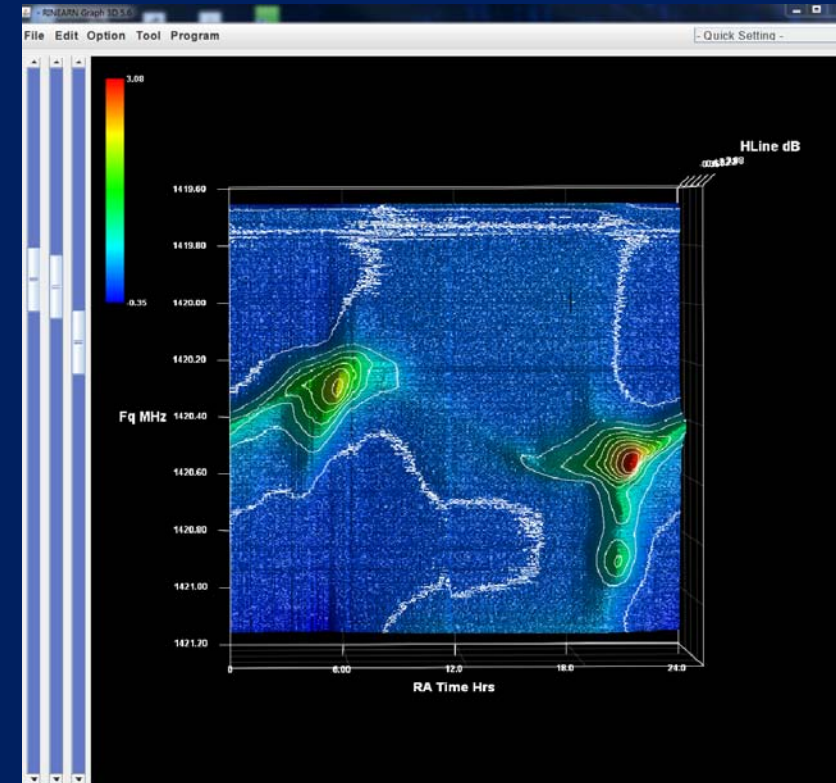


Disable all 'Auto' options

Select 'Else' and enter formats as shown below
to properly label frequencies & Time

Select the **Number of Sections** to make the plot increments
Show 'round' numbers.

(Image allow you to display a photo at a location)



- Design -
Frame: BOX TYPE
Margin of Numbers: 0.05
Length of Ticks: 0.05
☐ Draw inside
Line Width: 1.0
Number of Sections(X): 8
Number of Sections(Y): 4
Number of Sections(Z): 4
Number of Sections(Color B...): 1

- Format(X) -
☐ Auto
0.1 ~ 10: 0.00
Else: 0.00

- Format(Y) -
☐ Auto
0.1 ~ 10: 0.00
Else: 00.0

- Format(Z) -
☐ Auto
0.1 ~ 10: 0.00
Else: 0.00

- Visibility(X) -
☐ Auto
☒ Scale-X0
☐ Scale-X1
☐ Scale-X2
☐ Scale-X3

- Visibility(Y) -
☐ Auto
☐ Scale-Y0
☒ Scale-Y1
☐ Scale-Y2
☐ Scale-Y3

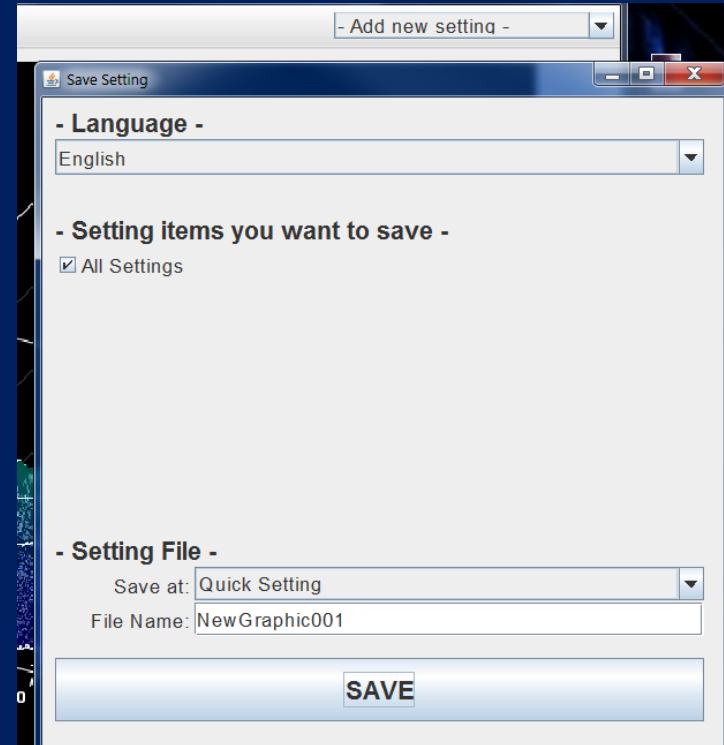
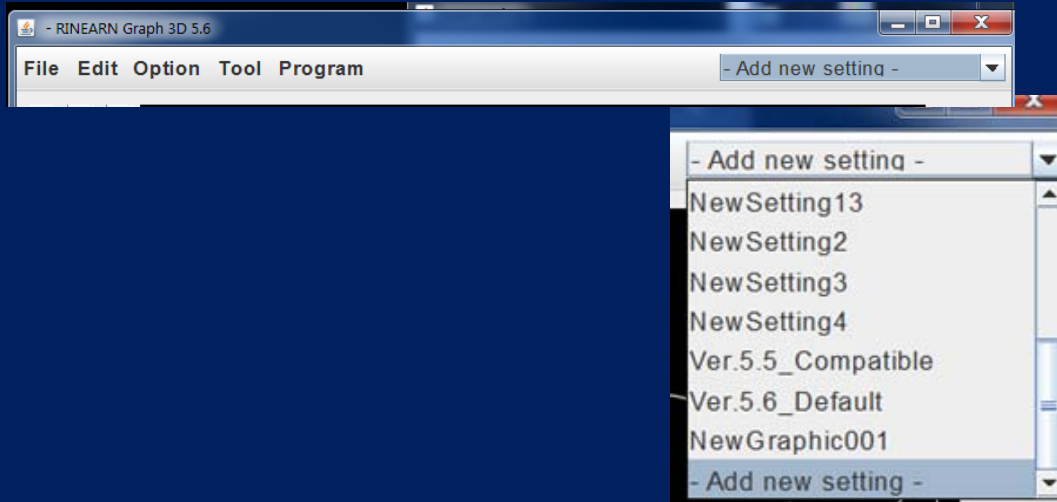
- Visibility(Z) -
☐ Auto
☐ Scale-Z0
☒ Scale-Z1
☐ Scale-Z2
☐ Scale-Z3

- Image -
X-Y Plane (Floor): OPEN (140 x 140 px)
X-Y Plane (Ceil): OPEN (140 x 140 px)
Y-Z Plane (at Min-X): OPEN (140 x 140 px)
Y-Z Plane (at Max-X): OPEN (140 x 140 px)
Z-X Plane (at Min-Y): OPEN (140 x 140 px)
Z-X Plane (at Max-Y): OPEN (140 x 140 px)
☒ Inside Only

SET

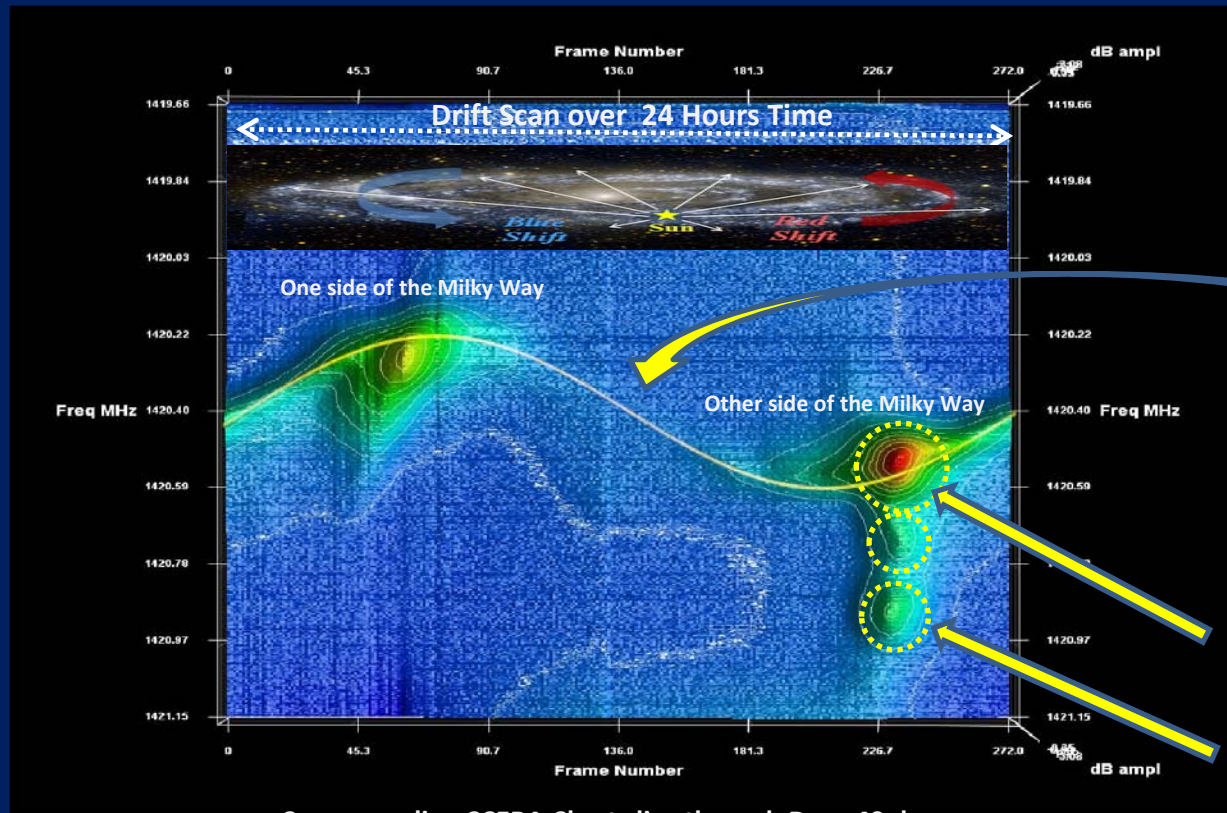
Add new setting

You can save **All** graphic **Settings** to Named **Quick Settings**

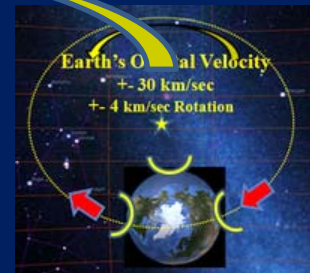


Understanding the 3D Graphics PLOT

*This is not intended to be a detailed explanation ,
but a starting point for researching the topics*



This Sinusoidal Curve is primarily the
result of your antenna pointing
Towards and then 12 hours later Away From
Earth's high Orbital Velocity around the Sun



This Doppler Frequency Shifted Spectrum
is from measuring Arms of the MW
moving at Different Velocities WRT Earth



Corresponding CCERA Chart slice through Dec +40 dg

