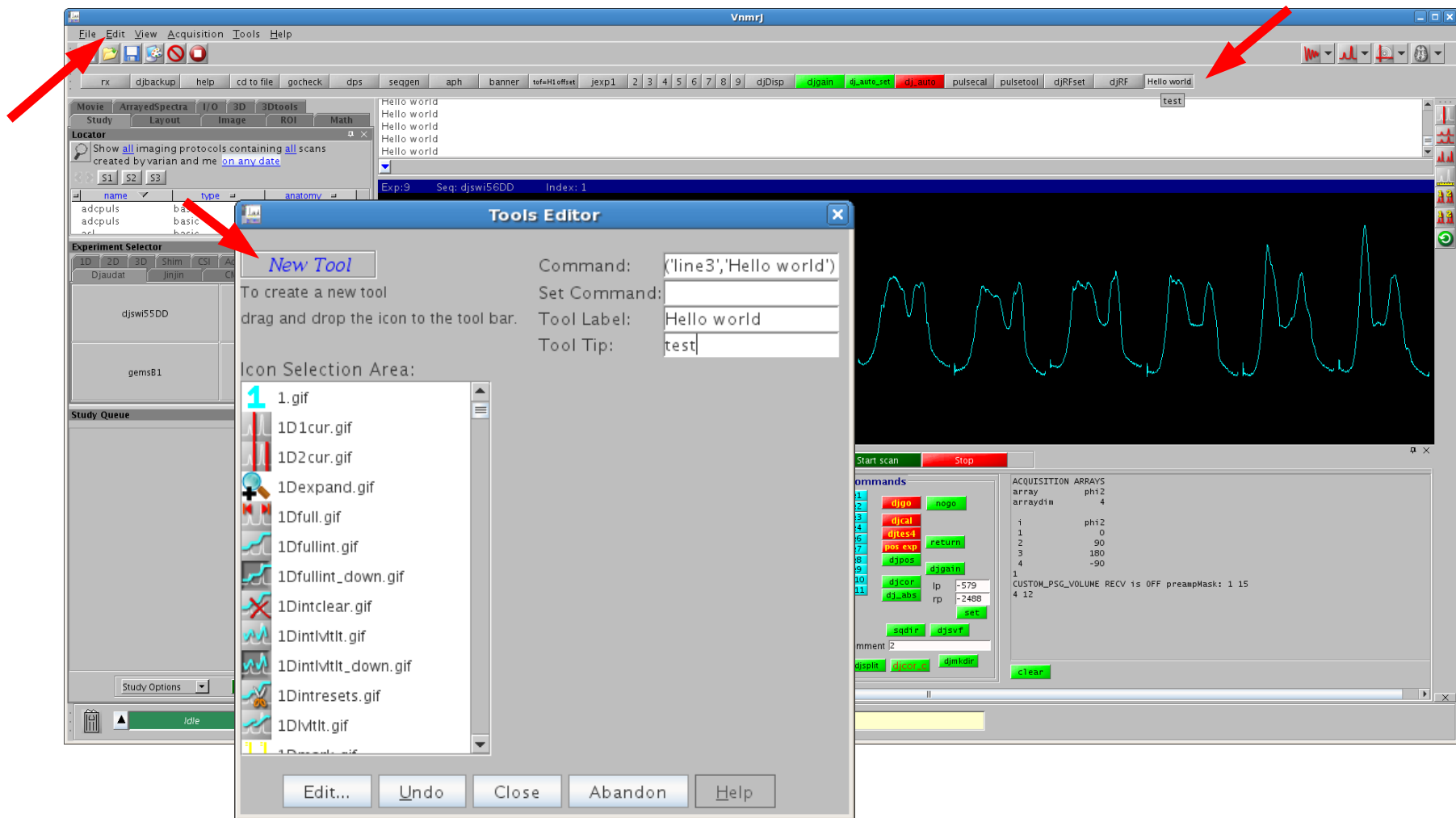


Advanced DJSWIFT

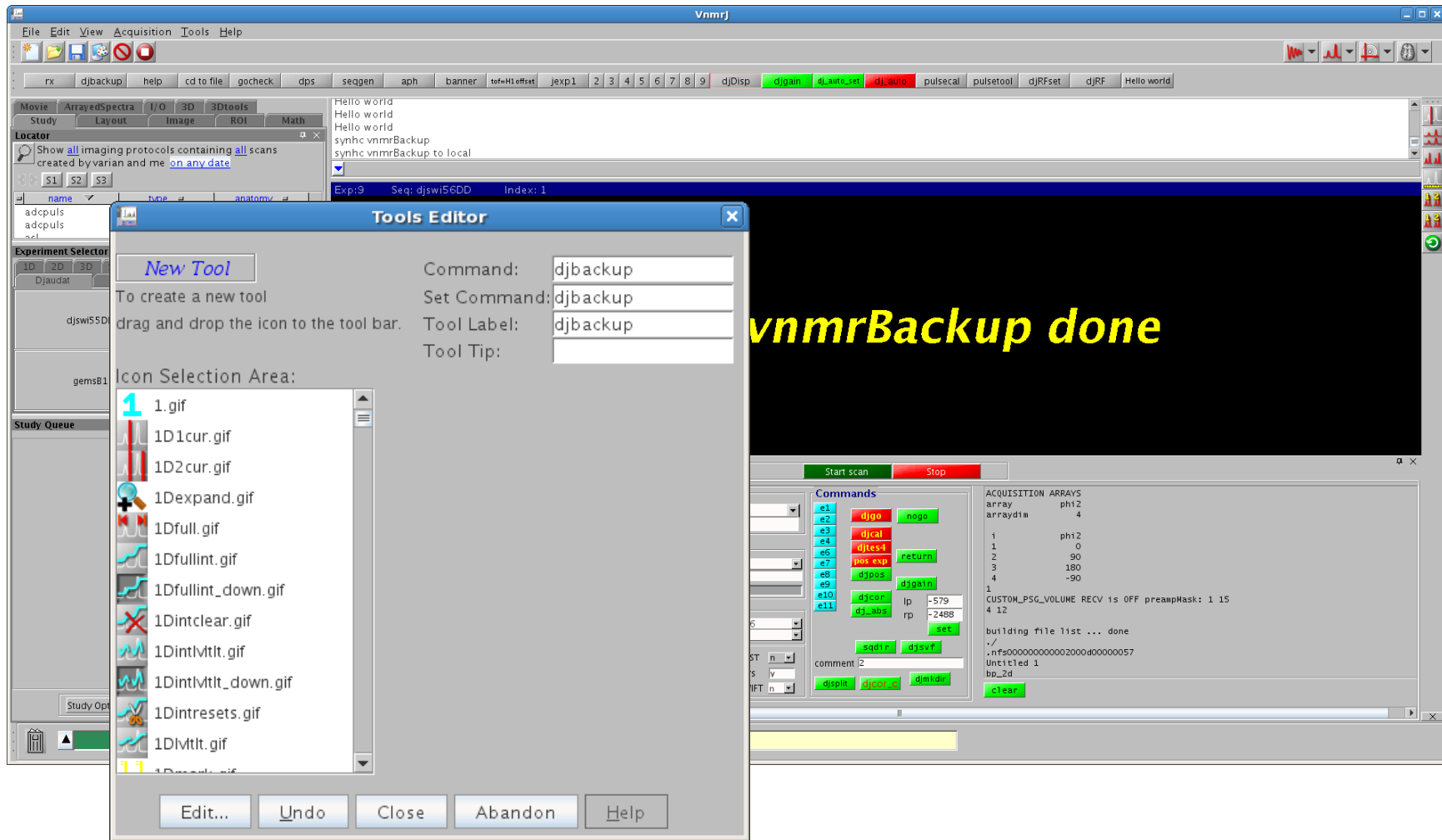
- Shortcut macros and Toolbar buttons
- Changing view orders

Toolbar buttons in VnmrJ



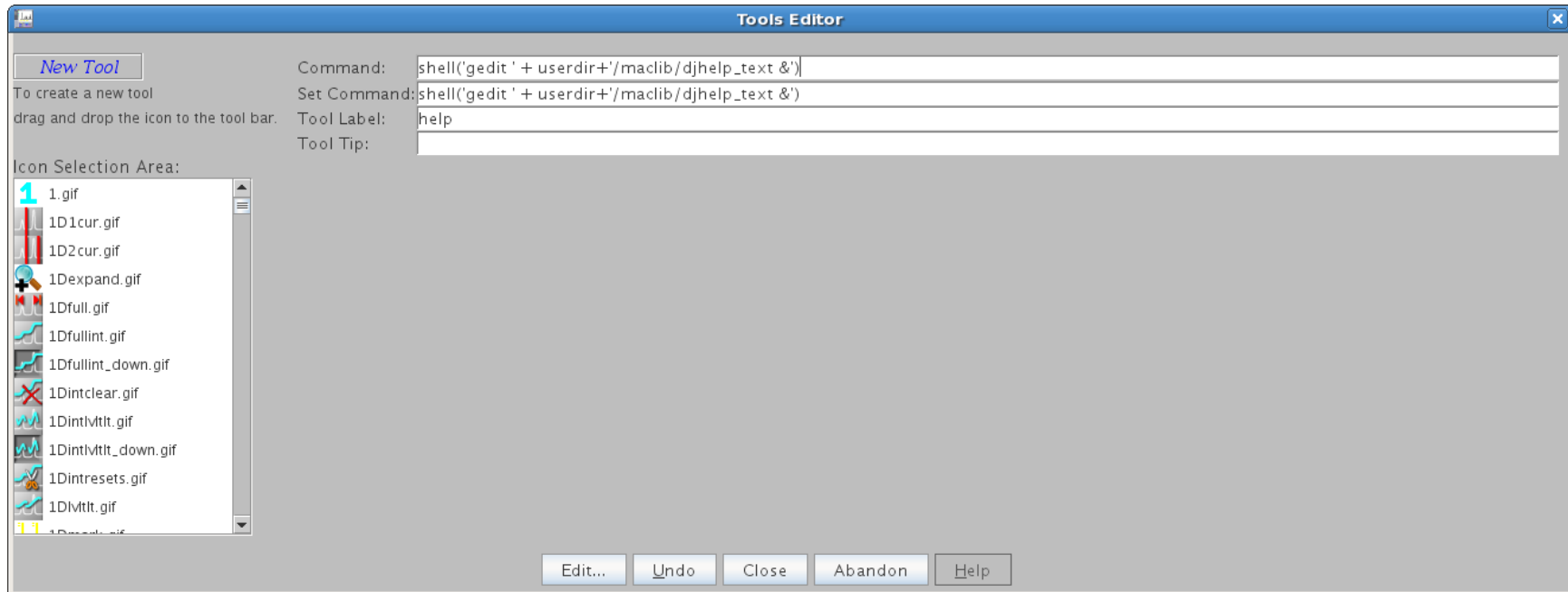
It can be very useful to set up some toolbar buttons in VnmrJ. To do so, choose Edit Toolbar... from the menus. Drag the “New Tool” to the Toolbar. This will align itself when you close the Edit Toolbar... window. When you are in the Edit Toolbar... window, click on a toolbar button to edit the command it runs. Commands can be in Magical macro language. (Bug: Tooltips disappear after editing.)

djbackup – back up sequences, settings



The djbackup macro makes a backup copy of your bin, cmrr, maclib, parlib, psglist, shapelib, and templates directories. They are saved under vnmrsys/vnmrbackupYYMMDD. Here is how you can set up the djbackup macro to run from a toolbar button.

Help and Notes file



The djhelp macro will use gedit to open a help and notes file called maclib/djhelp_text. This file contains some more notes about the DJ macros. This file may be overwritten in subsequent updates, but you can use this style of toolbar button to open a help/notes/bookmarks file for yourself with a shell command.

Swift Sequence vieworder gradient tables

The screenshot shows the Vnmrj software interface. The main window displays the Swift Sequence vieworder gradient tables. The sequence diagram shows a series of pulses and delays, with a scale bar indicating 4.0 ms. The control panel includes buttons for Start, Acquire, Process, Prescan, Gain, Start scan, and Stop. The command list on the right shows the sequence of commands used to build the gradient tables.

Parameter tpwr1 reset to maximum of 63
 Parameter tpwr3 reset to maximum of 63
 set power! tpwr = 56 for flip angle= 2 Ernst angle =3.500 (T1=2.479)
 Total SWIFT acquisition time = 0 h 1 min 24.788 sec
 CUSTOM_PSG_VOLUME RECV is OFF preampMask: 1 15

Exp:9 Seq: djswi56DD Index: 1

Study Queue

djswi56DD [unknown]

Start Acquire Process Prescan Gain Start scan Stop

Scan Plan Localize Advanced more SWIFT RF Pulses

Acq tof -536
 sw 02500
 swiftmodfr 02500
 rfraction 1.000
 djoversamp 1
 np 512
 Nspirals 32
 reScan 1
 nv 512
 nt 1
 recur 1
 gain 32
 djss 400
 djss2 32
 sw1 3003
 swreal 12500
 ntimes 32

Delay pw 3.2
 duty 0.2
 djtau 0.0006
 tramp 0.0003
 tr 0.0000
 djp 1.0000
 at 0.0041

FOV orient lro 33.01
 lpe 33.01
 lpe2 33.01
 pos1 4.21
 pos2 5.52
 pos3 -0.43
 nD 3
 anisotr 1.0

Flip angles flip1 2.00

Power tpwr 56
 tpwrfr 3580

RF pattern rftable abs1p256_16
 gtable square

Coils rfcoll Mikeswell
 gccoll SC72_50_500

Misc vieworder Nspir_Full
 seqfil d1swt56DD
 array ph12

Commands

array ph12 1 ph12 1 ph12
 arraydim 32 14 146.25 30 -33.75
 i 15 157.5 31 -22.5
 16 168.75 32 -11.25
 1 0 17 180
 2 11.25 18 -168.75
 3 22.5 19 -157.5
 4 33.75 20 -146.25
 5 45 21 -135
 6 56.25 22 -123.75
 7 67.5 23 -112.5
 8 78.75 24 -101.25
 9 90 25 -90
 10 101.25 26 -78.75
 11 112.5 27 -67.5
 12 123.75 28 -56.25
 13 135 29 -45

clear

idle CUSTOM_PSG_VOLUME RECV is OFF preampMask: 1 15

Load the swift sequence as before. Push the nogo button to build the needed gradient tables. These are saved in two places: one copy in the current directory along with the fid, and one copy in the tablib for the sequences to read. Use nogo to rebuild the tables whenever changing the view order.

Swift Sequence gradient table variables and storage

The gradient tables are saved in two places: one copy in the current directory along with the fid, and one copy in the tablib for the sequences to read.

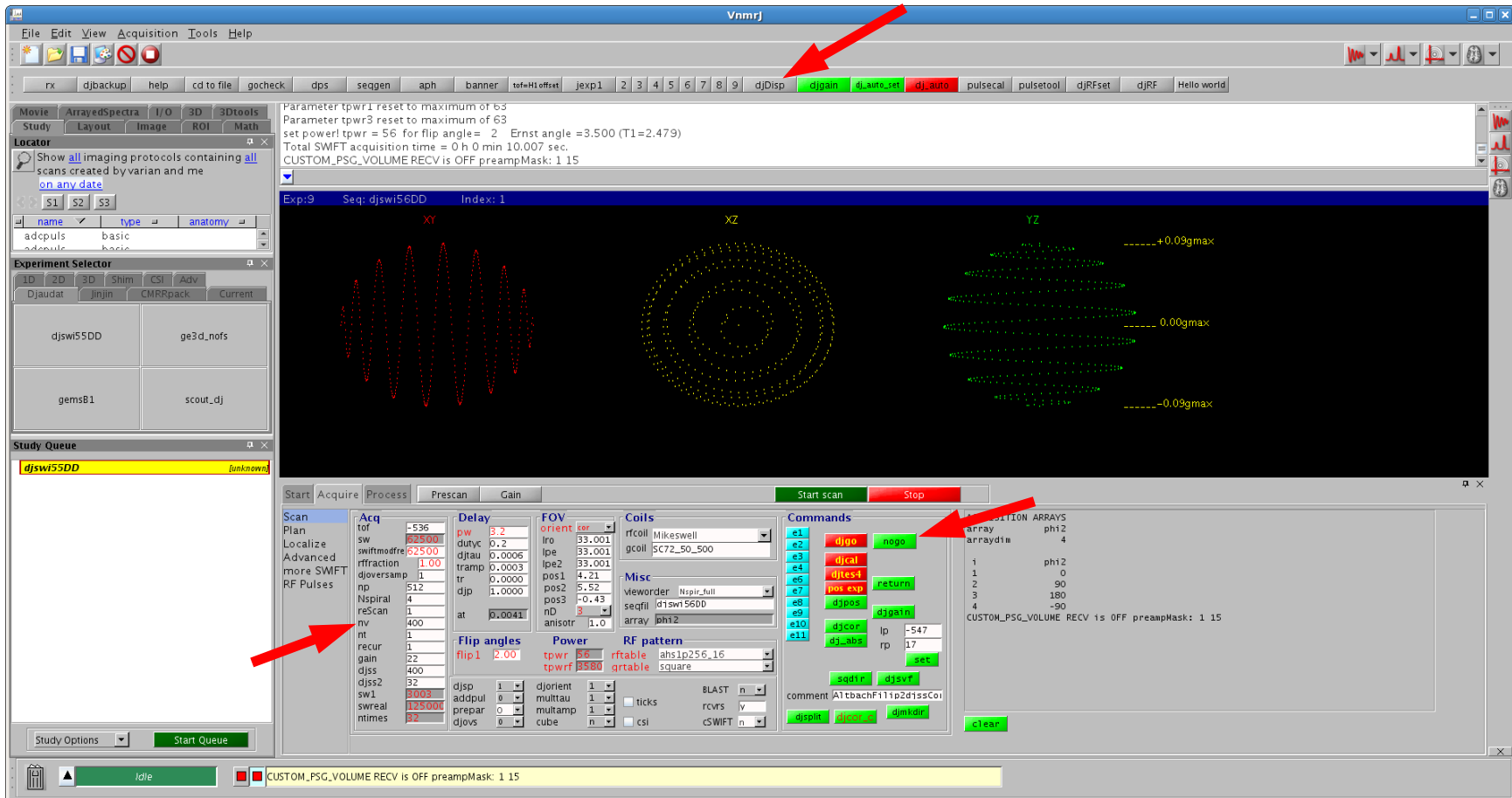
The tables in the local directory are named djswift01, 02, ... one for each spiral. The copy in the local directory is written in a data format with three columns.

The table in tablib is called djswift1. This copy is saved in string assignments to temporary variables.

Because of a limitation in the number of temporary variables available to a Agilent script, we restrict the number of tables to 16. Agilent makes variables t1-t60 available. The code loading the tables requires three temporary variables per table (one for each X, Y, Z). The variables used are named t10-t57.

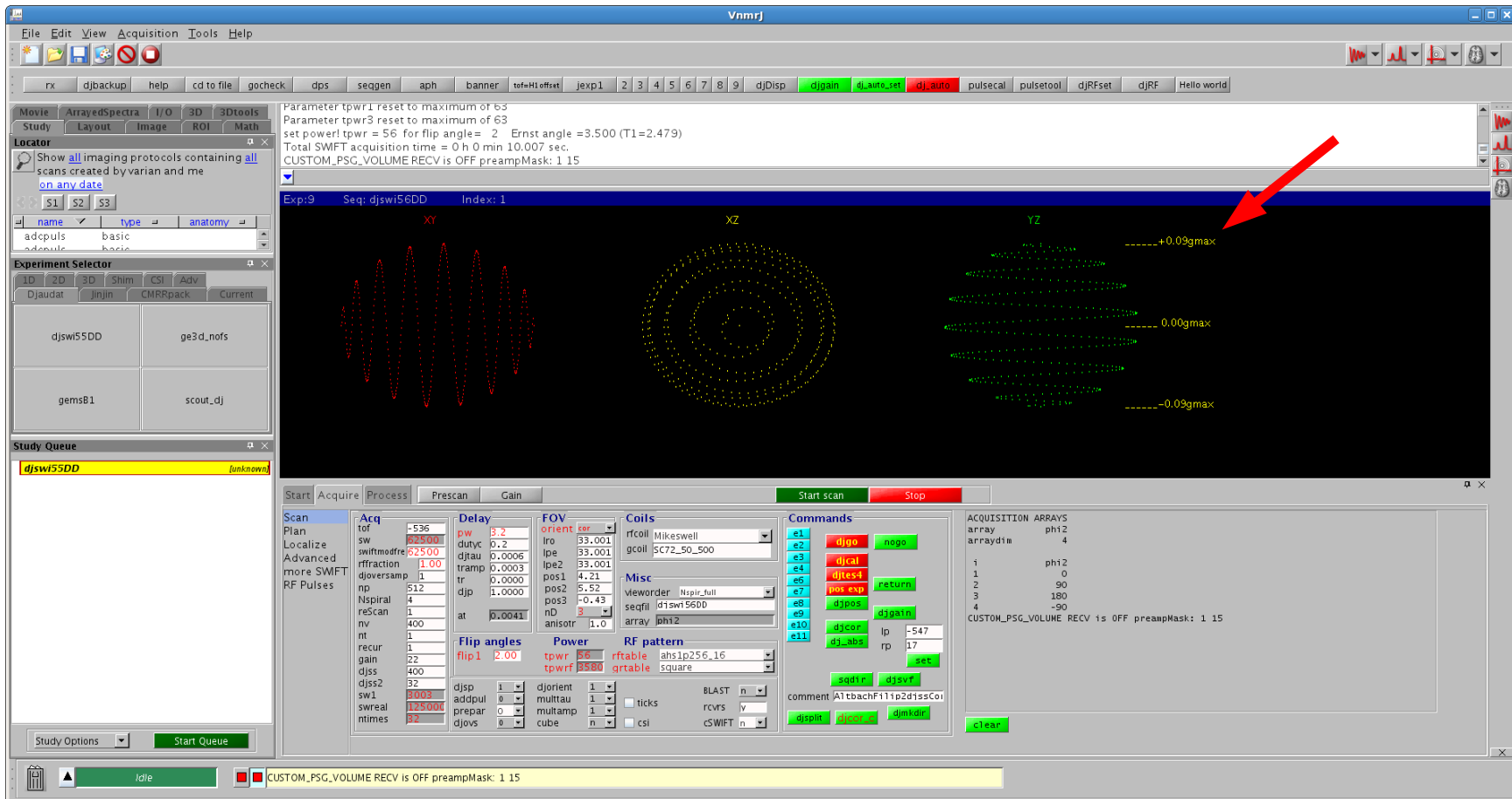
Because of this limitation of 16 tables, we are loading more than one spiral into a table where ever possible. The length of a Varian table is restricted to approximately 8k points. If NV (the number of points in a spiral) is small enough, the sequence will put more than one spiral in a table. Nbox is the number of spirals in one table.

Show view order



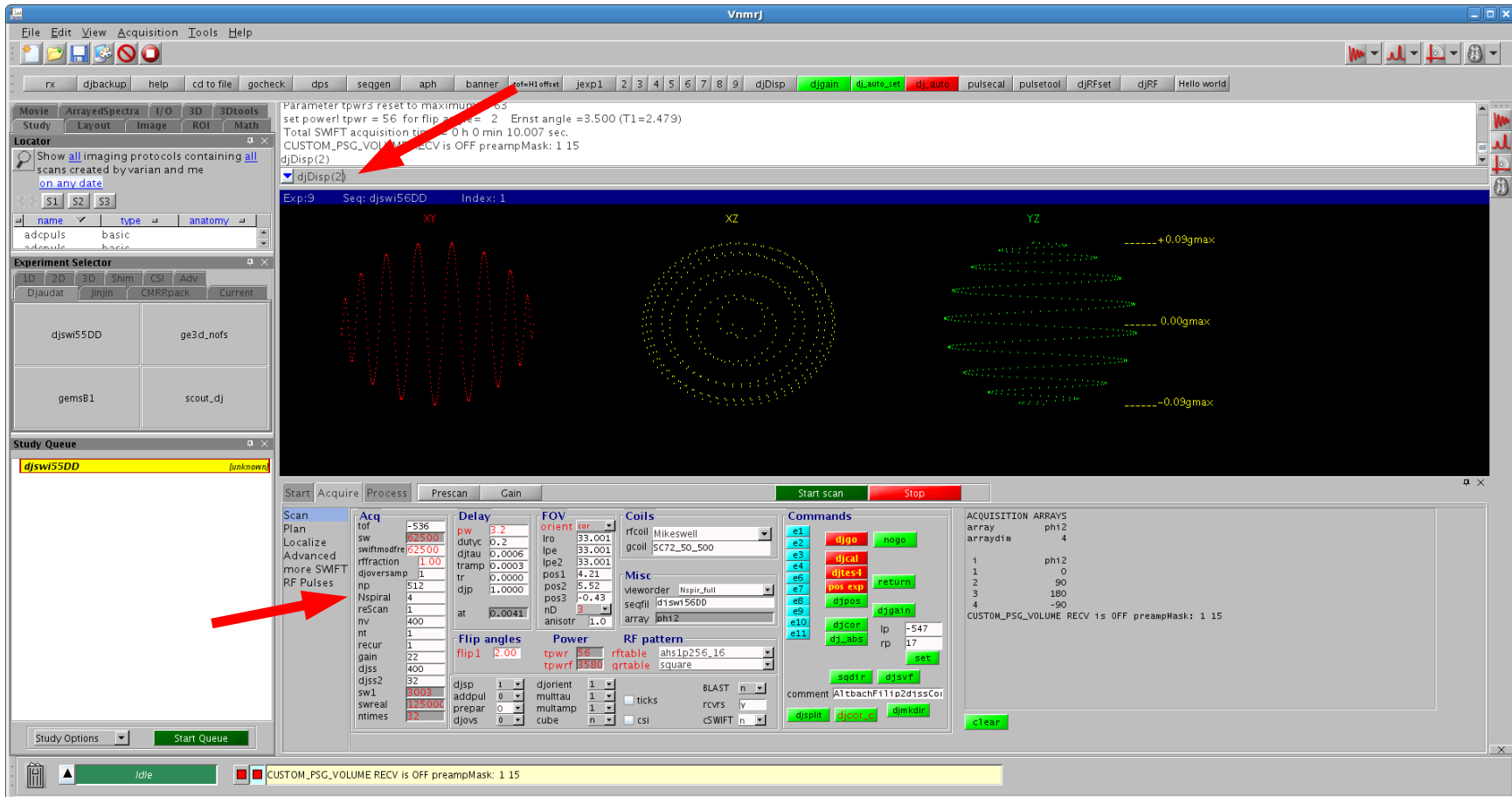
On the left side of the Acquire page, change nv to 400. Hit nogo to recalculate the tables, and then use the macro djDisp to display the view order. (We have djDisp in a toolbar button.) Notice that there are three views of the first spiral displayed, one for each of three orthogonal directions: XY, XZ, YZ.

Gradient vector size (percent of gmax)



On the right side, you see the maximum vector size of the gradient, relative to gmax, the maximum gradient value. In this case we are showing +/- 0.09, meaning that the maximum of the gradient used in the experiment will be no more than about 9% of gmax.

Displaying the second and following spirals



Typing from the command line, you can display the second spiral. The command is `djDisp(spiral number)`, e.g. `djDisp(2)`. There are Nspirals in the sequence. Each time this is done, it will erase the display first and show only the requested spiral.

Displaying multiple spirals at once

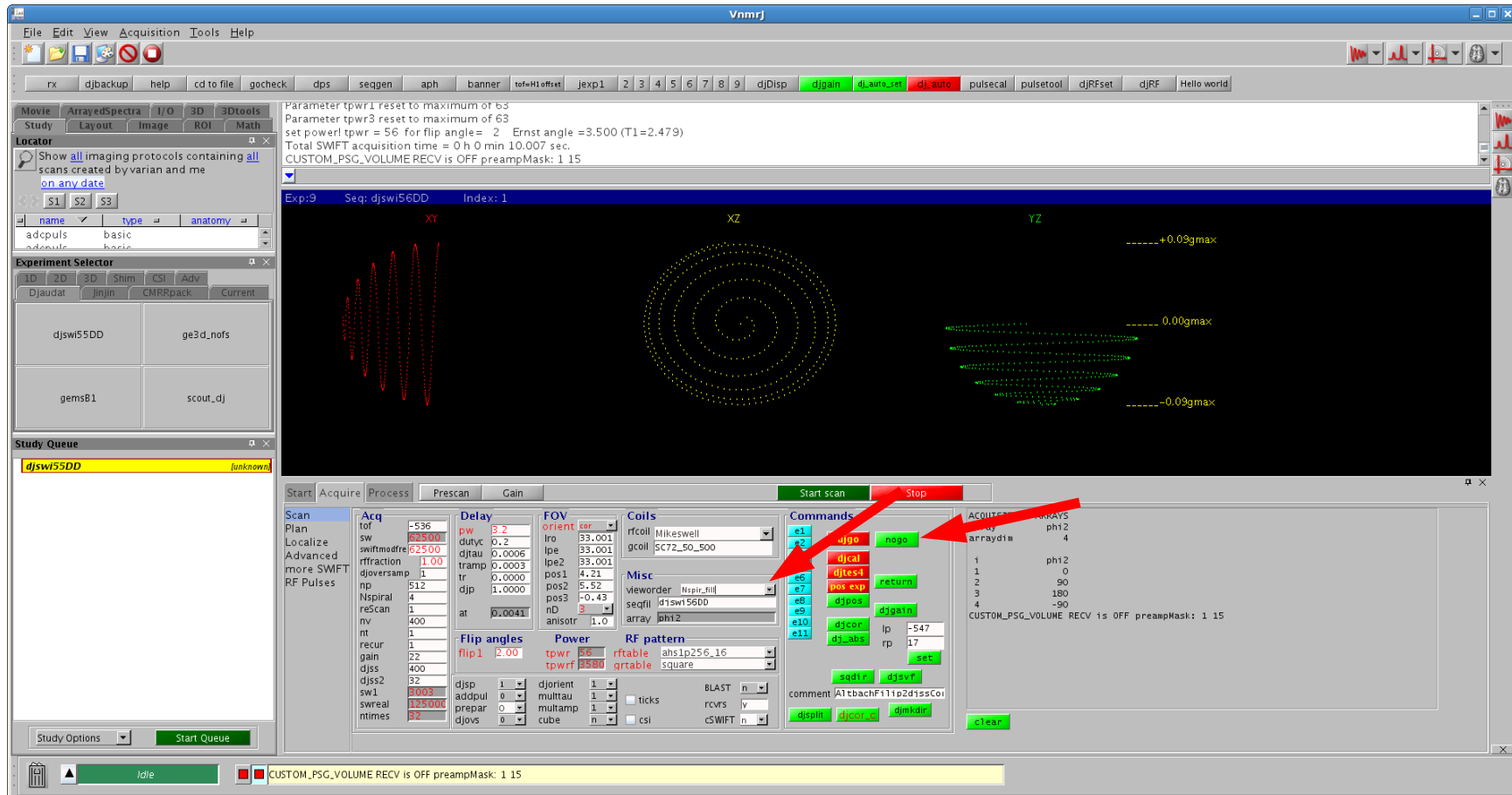
The screenshot shows the Vnmrj software interface. The main display area contains three plots: XY (red), XZ (yellow), and YZ (green). The YZ plot shows a spiral with a vertical scale from -0.09gmax to +0.09gmax. The command window at the bottom right contains the following commands:

```
e1  
e2 djgo nogo  
e3 djcal  
e4  
e5 djtes4 return  
e6 pos exp  
e7 djpos djgain  
e8  
e9 djtor lp -547  
e10 dj_aba rp 17  
e11 set  
sqdlc djstf  
comment A1cbachF11p2d1sscCo  
djspit  
dimkair
```

A red arrow points to the command `djDisp(3,1)` in the command window. The status bar at the bottom indicates `CUSTOM_PSG_VOLUME REC V is OFF preampMask: 1 15`.

To show multiple spirals at once, use the `djDisp()` macro with a second argument of 1. When there is a second argument to the macro, it will not clear the display before showing the spiral. To display only the second and third spirals, you would enter the commands `djDisp(2) djDisp(3,1)`

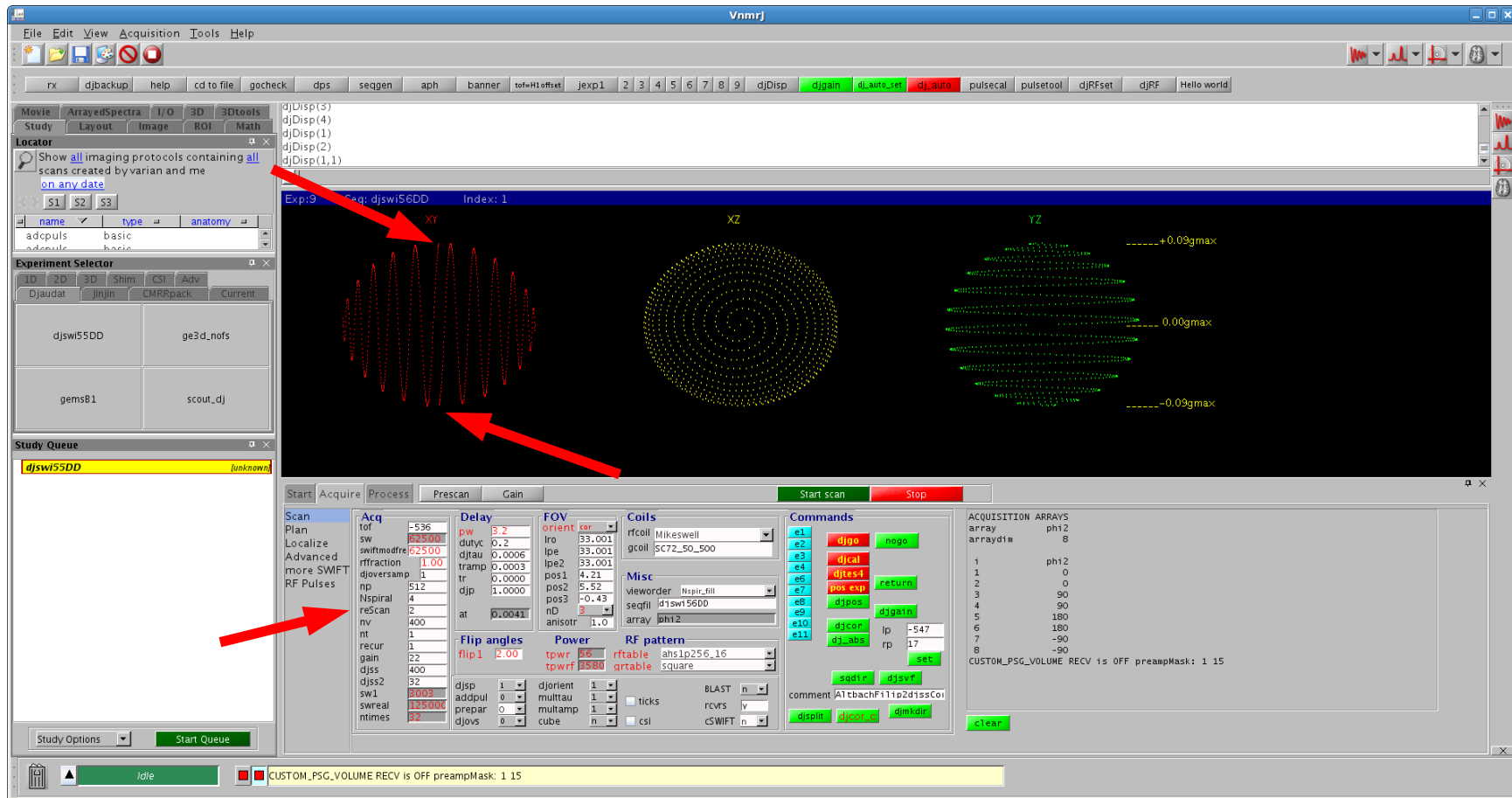
Trying different view orders



Under the Misc section of the Acquire page, you can change the vieworder selection to change the way the spiral is created. Don't forget the nogo button.

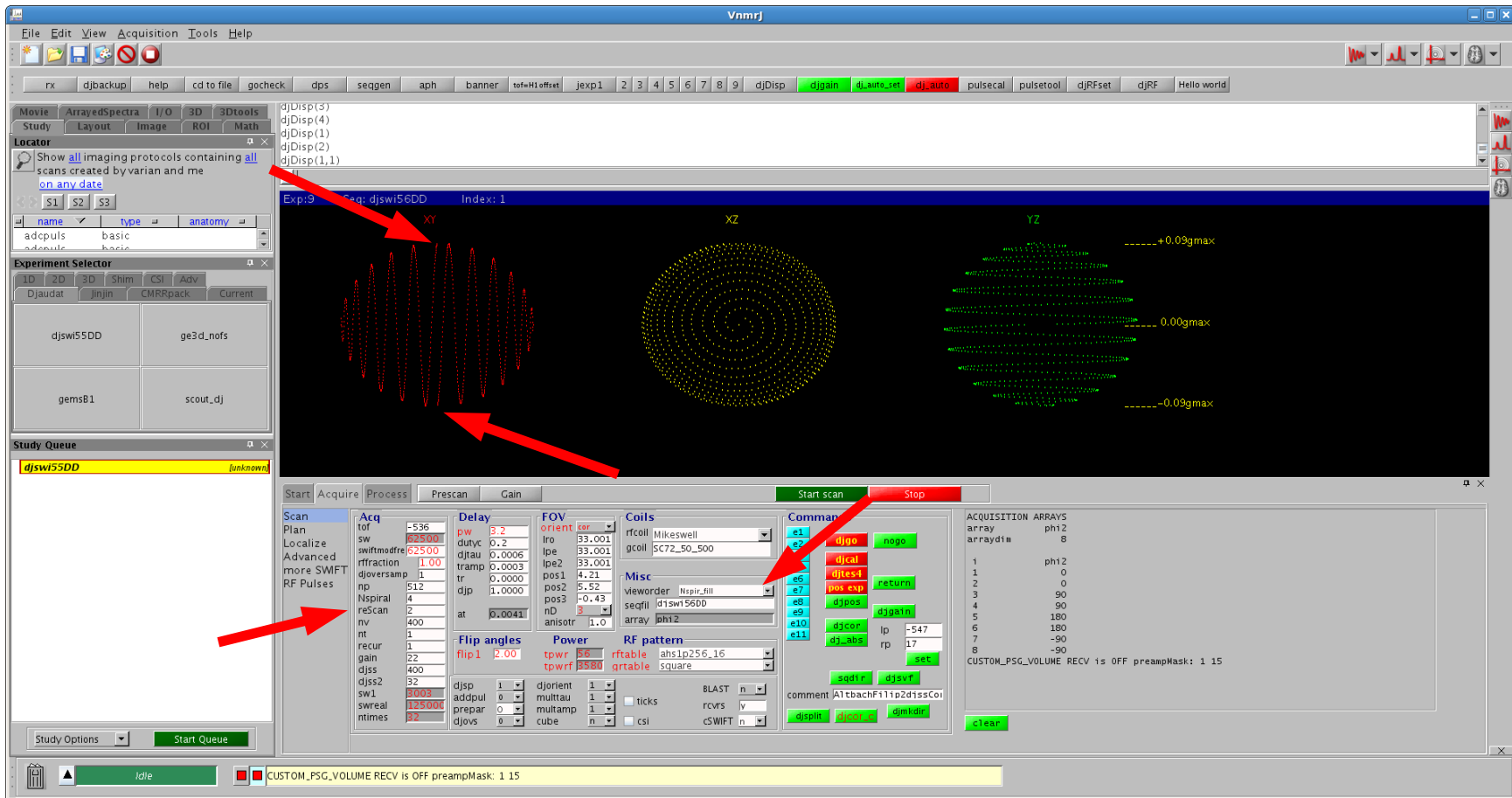
In the vieworder **Nspir_full**, each spiral traces an entire sphere.
In the vieworder **Nspir_fill**, each spiral traces just a hemisphere.

Using the reScan parameter



You can set the reScan parameter = 2 to create twice the number of spirals. Every second spiral is the inverse of the original. This is calculated by inverting the sign of the gradient and has the advantage that it does not require any more console memory. This will work with any of the view orders.

Using the reScan parameter with Nspir_fill (hemisphere)



For example, if you are using Nspir_fill (hemisphere), you can set reScan to 2. This will make every second spiral use the reverse hemisphere, giving full coverage of the sphere. This image shows the first and second spirals with Nspir=4, reScan=2, vieworder=Nspir_fill. You can see the spiral reflected by noticing the spirals' endpoints.

Toolbar buttons in VnmrJ

Text...

Toolbar buttons in VnmrJ

Text...