### 1D NMR VnmrJ Quick Guide Rosha Teymoori

# 1) Getting started

- Log on using your Username and Password.
- Click on the VnmrJ Desktop Icon.
- Type *e* <Ent>. Place sample in spinner. Gauge properly. Place on top of magnet. Type *i* <Ent>.
- Click Experiments=>Proton (or desired expt.) type su <Ent>.
- In the bottom Parameter Panel, select the **Start** tab and the **Standard or sample info** page.

Start Acq	juire Process	Insert Eject	Lock scan	Setup hardware	Auto lock Auto
Sample Info Lock Shim Spin/Temp	Operator: vnmr1 Sample informa Sample name Sample directory Solvent Concentration Notebook Page	ation / (_20150731_01) CDCI3 DMSO CDCI3 D 0 ml	Clear 20 Other	Email Comments	ARAMETERS

- Choose your solvent from the **Solvent** dropdown menu.
- Add your text to the **Comment** field.
- Check spinning. If you want to spin the sample. Go to start menu, left side Spin/Temp section to regulate spinning speed

Start Ac	quire Process	Insert	Eject	Lock scan	Setup hardw	are	Auto lock	Auto tune	Grad
Sample Info Lock Shim <mark>Spin/Temp</mark>	Spinner: liquids Regulate Speed O Current O Hz	Off	Spir	1 Off	Control s Cotrol s Abo Warr O Igno	s <b>pinr</b> rt afte n afte re spi	<b>her from thi</b> er spinner erro r spinner error inner error	s panel only r	
	Temperature Regulate Temp 25 Current 25.0 C	Regulated	Tem	p Off	Control t Abo Wari Igno	<b>emp</b> rt afte n afte re ter	erature fror er temperature r temperature nperature erro	n this panel o error error r Reset VT Controi	i <b>nly</b> Iler

• Set up the temperature if you are planning to run an experiment at higher temp (max Temp = 65C)

# 2) Lock

- Type Lock
- Wait for the message Idle in the message box at the bottom of the panel

Start Ac	quire Process Inser	t Eject Lock scan	Setup hardware Auto Io	ck Auto tune	Gradient shim Logout
Sample Info Lock Shim Spin/Temp	□ Spin       0 Hz         ☑ Lock       57.7         Lock status       Regulated         Select lock signal         Find z0	20     ±1     -5962     =       -5962     ±1     20     =       20     ±1     20     =       Gain     38     ±1     38     =       Phase     ±1     265     =	Ţ	 	Autolock Automatic Sample 20 only Unlocked Not used Run autolock
e be	▲ Idle	exp4: Setup C	Complete		

# **3) Shimming**

- Go to start shim
- Adjust Z1, and Z2 until the lock signal is max

Start A	Acquire Process	Insert Eject	Lock scan	Setu	p hardware	Auto lo	ck Auto tu	ne Grac	lient shir
Sample Inf Lock	• Lock scan FID scan		Z1 -5649 Z2	±10 X1 -52	233 ±	:10 X3 4611	±10	Z3X 2313 Z3Y	±10
Spin/Tem	z0 -5962 ±1	77.1	731 Z3 -7841	±10 -19	56 ± 350 ±	10 6523	±10	-2105 Z2X2Y2 -1266	±10
	Lk Power ±1	11.2	24 -3711 25 .7779	$\pm 10 \begin{vmatrix} 12 \\ 567 \end{vmatrix}$ $\pm 10 \begin{vmatrix} XY \\ 114 \end{vmatrix}$	70 ± 40 ±	:10 <u>729</u> :10 ZXY :10 -3698	±10 ±10	22XY 873	±10
	Lk Gain 38 ±1		Z6 9140	±10	12 586 ±	10 ZX2Y2 -1002	±10	_	
	Lk Phase ±1	Lock 77.2	Spin on Spin O Spin off	ff Hz	Read defau	lt shims from pars	Save1 Rea Save shim	d1 <mark>Save2</mark> s Read	Read2 shims
					Receiver gai	in 20	File		

# 4)Tunning

• Type *su* <Ent> tune via the pre amp, press the chan bottom



• Take the probe cable from pre amp ( right side) and attach it to probe in 'tune interface''



 channel 1 is proton, the matching and tuning rod has an orange labeling, tune and match until you see small number like 001 which is shown in the above picture.



 $\circ$  For <sup>13</sup>C acquisition, channel 1 is <sup>13</sup>C and channel 2 is <sup>1</sup>H, <sup>13</sup>C rods are green. Turn match 4 and tune 1 rods



## 5)Acquiring your spectrum

#### • Select the **acquire** tab and the **default** page

Start Acquir	e Process Show time Go Stop MoveSV	V Est. pw90 Arrays Seque
Default H1 Acquisition	Experiment: PROTON Solvent: dmso O	bserve: H1 Decoupler: C13
Pulse Sequence Channels	Acquisition options	Receiver gain (dB) 20
Flags Future Actions	Spectral width (select) ppm (or enter) -2.0 to 14.0 ppm	
Overview	Number of scans 4	
	Pulse angle array V degrees	

- Chose your parameters, or type
- $\circ$  *nt* (number of scan) = desired number
- $\circ$  d1(delay between scans) = desired number
- $\circ$  bs (block size) = desired number
- *Type ga* or *go* or click on GO bottom
- Message :BS# completed
- Type wft to process
- When complete *f full aph vsadj* <Ent>

## 6)Referencing your spectrum:

- locate your solvent peak
- Click the **Cursor** icon and place red cursor line on top of solvent peak.
- Type *nl rl(<your solvent ppm>p)* <Ent>. For example, for CDCl<sub>3</sub> you would *type nl rl(7.24p)* <Ent>.

# 7)Integrating your spectrum ( not for 13C NMR)

- Click the **Full spectrum** icon and click the **Integral** icon
- Type *cdc dc cz* <Ent>
- Expand around first desired integral region.
- Click **Resets** icon (it has scissors).
- Use a *left* mouse click for each integral reset point. If you make a mistake, use the *right* mouse button to undo last reset point. To restart, type *cz* <Ent>.
- Click the **Hand** icon and drag the spectrum to next region, click **Resets** icon, left click your next points, repeat for every region.
- When complete, click Full spectrum icon.

## 8) Plotting your spectra

- Typical example, *pl pscale ppf pir pltext page* <Ent>
- Type *ds*<Ent, expand desired plot regions, and repeat plot command

# **Common Plotting Commands:**

pl	plot spectrum
pscale	plot scale
pir	plot integral regions
ppf	plot peak frequencies
pll	plot line list with freqs in Hertz
pltext	plot text
<i>pltext</i> (150,150) parameters	plot text in top right (use with pll) pap plot all
page	send plot to printer



VNMR Basic Commands						
Command	Description	Typed Example				
nt	<b>number of transients</b> : Sets the number of transients (scans) to be acquired. You should always select a multiple of 4 (e.g. 4, 8, 128). The larger the number of scans, the better the signal to noise.	<i>nt=16</i> : default setting for 1H,CDCl3				
bs	<b>block size</b> : Directs the acquisition computer, as data are acquired, to periodically store a block of data on the disk.	bs=8 : sets the block size to 8 scans.				
ga	<b>submit experiment to acquisition and FT the result</b> : Performs the experiment described by the current acquisition parameters and Fourier transforms ( <i>wft</i> ) the result.	ga				
wft	weight and Fourier transform 1D data: Performs a Fourier transform on one or more 1D FIDs with weighting applied to the FID.	<i>wft</i> : used if you stop the acquisition prior to completion or when loading a saved FID.				
aph	<b>automatic phase of rp and lp</b> : Automatically calculates the phase parameters lp and rp required to produce an absorption mode spectrum and applies them to the current spectrum.	<i>aph</i> usually gives well phased spectra				
f, full	<b>full</b> : Sets the horizontal and vertical control parameters to produce a display on the entire screen.	f or full				
vsadj	Automatic vertical adjustment: Automatically sets the vertical scale, vs, in the absolute intensity mode so that the largest peak is at the requested height.	<i>Vsadj</i> : resets the vertical scale to fit on the screen				
dscale	Display scale below spectrum or FID.	dscale				
aa	abort acquisition: immediately aborts the acquisition.	аа				
sa	stop acquisition: stops acquisition after acquiring current transient.	sa				
su	<b>submit a setup experiment to acquisition</b> : Sets up the system hardware to match the current parameters but does not initiate data acquisition.	su				
svf	Save FIDs in current experiment: Saves parameters, text, and FID data in the current experiment to a file.	<i>svf('H1_070703')</i> : saves the FID as a file named H1_070703				