1. Presaturation of Solvent Resonance.

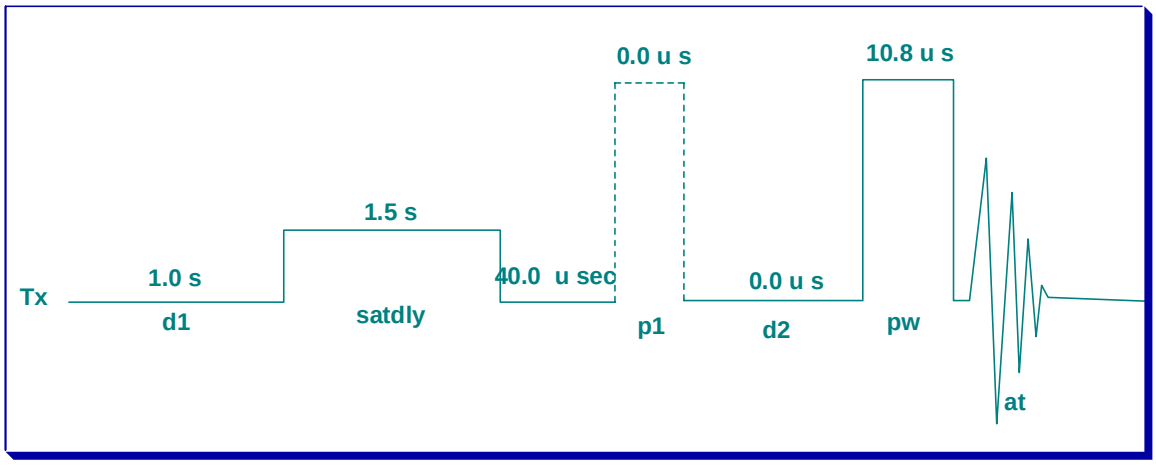
This technique involves irradiating at the precise solvent frequency with a long (~ 1 sec.) low-power signal to saturate (equalize populations) the solvent protons meaning that the number of magnets at the lower energy level is equal to that at the higher level ($N_{1/2} = N_{-1/2}$). There is no transition for the solvent protons. Then a normal high-power (non-selective) pulse is immediately delivered to excite the solute nuclei and obtain an FID. The solvent protons have no population difference ($M_z = 0$) at the time of the high-power pulse and therefore produce no magnetization in the x-y plane and no signal in the FID.

2. VNMR discreption.

The **presat** macro sets up a standard two-pulse sequence with optional composite observe pulse.

satmode='y', gives observe transmitter saturation at "**satfrq**" with "**satpwr**".
sspul='y' does ***trim(x)trim(y)*** to destroy all magnetization.
composit='y' uses composite 90 for **pw**.
presat is executed only if **satdly>0**(**satflg** not active)

3. presaturation pulse sequence



4. The default parameter list for a water-containing sample.

acquisition		sample		processing		flags	
sfrq	399.73	date	may 8, 2004	lb	1	il	n
tn	h1	solvent	D_2O	sb	not used	in	n
at	3.744	file	exp	gf	not used	dp	y
np	44932	decoupling		fn	not used	hs	nn
sw	6000	dn		math	f	saturation	
fb	3000	dof	0			sspul	n
bs	16	dm	nnn			satpwr	2
ss	0	dmm	c			satfrq	0
tpwr	63	dmf	11148			satdly	1.5
pw	10.8	dpwr	42			satmode	ynn
p1	0						
d1	1.000			werr			
d2	0			wexp			
tof	-154.5			wbs			
nt	1			wnt			
ct	0						

5. The instructions

Text in **bold** is typed on the command line with [return] after each line.

- Set up the experiment as you normally would, lock and shim the sample
- **dn='H1' dm='n' nt=1 ss=0 gain=0 ga**
- When the spectrum is displayed set the cursor on the solvent signal (here is water).
- **nl ,** which moves the cursor exactly at the water peak.
- **movetof**
- **presat** to set up the presaturation experiment.
- **dps** to take a look at the pulse sequence.
- **satdly=1.5** you can change it to another number, normally more than 1 sec.
- **satfrq=tof,** if it is 0, you need change it to the number of **tof**.(**tof** is obtained by placing the cursor at the water peak with a command of **movetof**. You might need to type **dg** to get the number on the text window in the previous **s2pul** experiment.
- **satmode=’ynn’** is the saturation mode which has been automatically set to ‘ynn’.
- **sspul** - set to **'n'** (**sspul** is an extra pulse to remove residual X-Y signals. Set this to **'y'** if desired.).
- **satpwr** - saturation power, this is dependent on sample, 2-10 dB
- **d1=0** Collect 1 transient to test.
- Optimize the parameters for best suppression. Parameters that may be altered to improve the saturation include checking the saturation frequency **(satfrq**). This

parameter can be arrayed around the starting value to find an optimum. Also, increasing **satpwr** may help. Be sure to increase the gain, use steady state scans (**ss=32** optimum) and collect at least 8 transients for the final spectrum. A well-suppressed sample can often achieve a **gain=30,40** or 50 without a receiver overflow