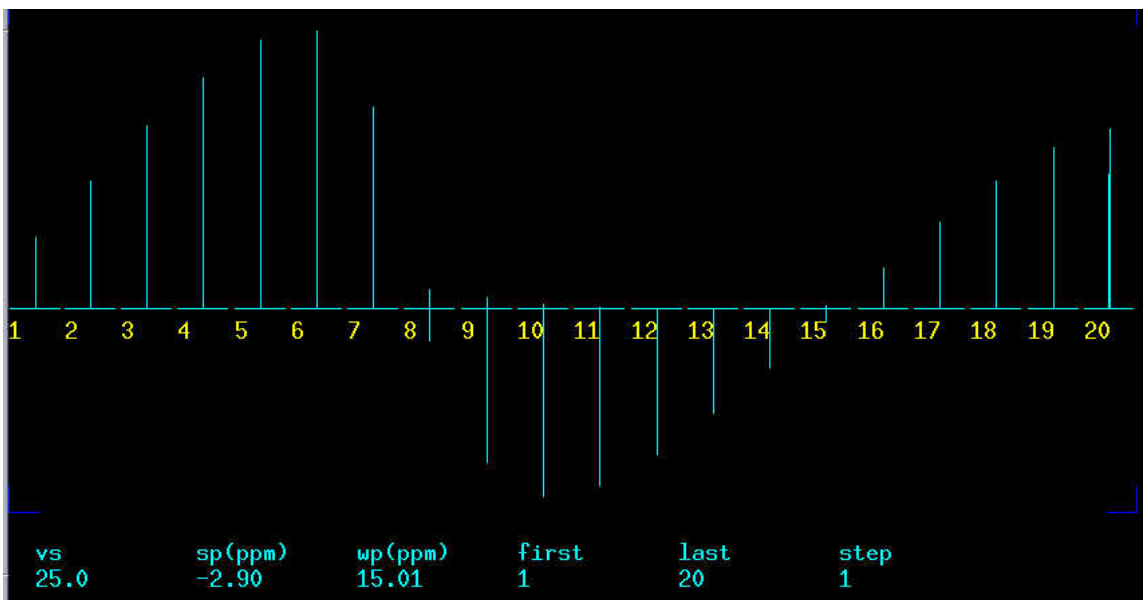


5. How to calibrate pw90?

You are able to do s2pul H1 spectrum. But you may need to get a better spectrum. In the future, if you want to do 2D NMR such NOESY, TOCSY and REOSY, you need to calibrate the right pw90. To do this, you need to calibrate pw90 and determine the **pw**.

1. type **nt=1**, type **ga** to get a 1D simple spectrum;
2. type **array**, enter;
3. type **pw**, enter; [how many steps?]
4. type **20**, enter; [starting value]
5. type **5**, enter; [increment]
6. type **4**, enter. The lower TEXT window will display the array. If you don't see it, type **da**.
7. type **nt=1**;
8. type **ga**.

You will see 20 spectra by typing **dssh**, which look like the following figure. To number each spectrum, type **dssl**. [If you type **dssa**, you will see stacked spectra horizontally]



When you see the spectra arrayed in a sine wave, try to find the 360 spectrum and do array again using small increment, 1 micro second starting from the number of 14th. The pw360 is somewhere around the 15th.

Your $\text{pw}_{90} = (360 \text{ pulse width})/4$. Now set your $\text{pw} = \text{pw}_{90}$.

Troubleshooting:

My spectra are too big and they look the same height.

First, type **ds(1)**, then type **f full**; **ds(4)** displays the 4th spectrum;
Type **ai** (absolute intensity) or adjust the first spectrum by clicking the middle mouse button above/below to increase/decrease the intensity; You can also type **vs=vs-5** (or **8**) to lower the intensity.

Change the vertical scale to move the spectrum up by type **vp=50** or (**vp=60**);

Now type **dssh dssl** and see all the spectra.

Tips:

1. The maximum **tpwr** is 63. You can change it to a lower value by 3 dB, such as 60, 57, 54. If **tpwr** is over 63, you may damage the probe.
2. The bigger the **tpwr**, the smaller the **pw** is.
3. If you already knew your **tpwr** with calculated pw_{90} , and you want to lower your **tpwr** and get a related pw_{90} . You should do the following:

$$(\text{tpwr})_n = (\text{tpwr})_0 - n, \quad (\text{pw})_n = (\text{pw})_0 * [2^{(1/6)}]^n = (\text{pw})_0 * [2^{(n/6)}]$$

For example, if your $\text{tpwr} = 63$, $\text{pw} = 10$; you want tpwr to be 60, what the pw would be?

$$\text{pw} = 10 * [2^{1/2}] = 10 * 1.414 = 14.14.$$

If you want the tpwr to be 62, what the pw would be?

$$\text{pw} = 10 * [2^{1/6}] = 10 * 1.12 = 11.2.$$

Do you know that $2^{1/6} = 1.12$; $1.12^6 = 2$?

This means you drop 1 dB of power, you have to increase pw by 1.12 times.

4. *If you set tpwr to 63, your pw is probably somewhere around 10. A full range of 360 angle would be ~40. so you need to array pw , which covers 40. If you set tpwr to 57, your pw would be ~17, you need to array pw with the proper start value and a proper increment to cover 68.*

