Laboration 10

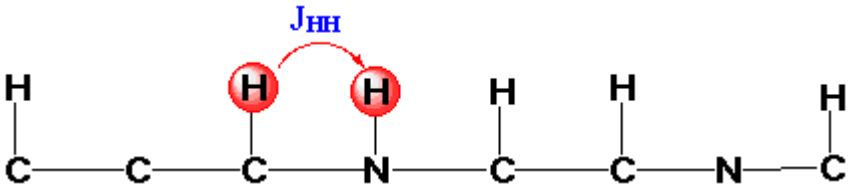
COSY
Magnitude mode

KR

Theory

COSY

The **2D COSY (COrrelation SpectroscopY) experiment** is the most simple and widely used 2D experiment. It is a homonuclear chemical shift correlation experiment based on the transfer polarization by a mixing pulse between directly J-coupled spins. Thus, homonuclear through-bond interactions can be trace out by simple analysis of the 2D map providing a more general and more useful alternative to classical 1D homodecoupling experiments.



Practical

1. Run a *PROTON* according to"Bruker run manual for 500 MHz NMR".
   The 2-D exp should be recorded non spinning, so for a better result shim also the non spinning shims x, xz, y, yz manually (the auto-program topshim only shim the z shims)

2. Optimize the values of **o1p** and **sw**

3. Check the ^{1}H 90^{o}-pulse (lab 3).

Experiment setup

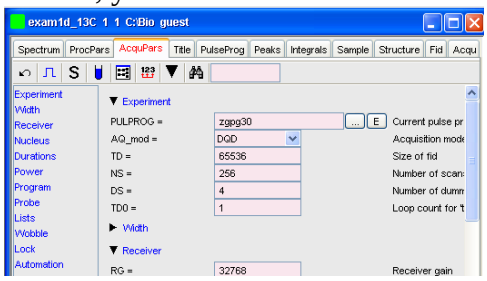
1. **edc** or **new** and read the parameter set ***A_COSY***

2. **getprosol** (get probe and solvent specific parameters from prosol)

   or if the ^{1}H 90^{o}-pulse value need to be changed

   Set the measured **p1** (^{1}H 90^{o}-pulse)
   getprosol 1H *'p1-value' 'pl1-value'* (*get pro*be and *sol*vent specific parameters and use your adjusted p1 value to calculate related pulses)

3. If required, any acquisition parameter can be modified manually or in the *AcquPars* section, you can see what is valid for the parameters in *PulseProg*.



a. **o1p** is the center of the 1H spectrum

b. **sw** (F1)same exact value as sw (F2), you get it from 1H spectrum

c. **td** (F2) is the time domain in the F2 dimension (usually set to 1K-2K)
Set it to **1024** (1K)

d. **td** (F1) is the number of experiments/increments to be recorded in the F1 dimension (usually set to 64w-512w)
Set it to **64**

e. Set appropriate **ns**, depending on the time you want the experiment to take.

4. turn off the spinner
5. **rga**
6. **zg**

Process recorded data

7. **xfb** add a window function and Fourier transform the data.
8. **abs1, abs2** perform a baseline correction
9. In the *Procpars* section set sr(F1) and sr(F2) to the same value as in the 1H spectrum (already calibrated)
10. If the spectrum is very noisy (t1-noise) you can try to symmetrizes the 2-D data with **sym**. Be careful! Why?