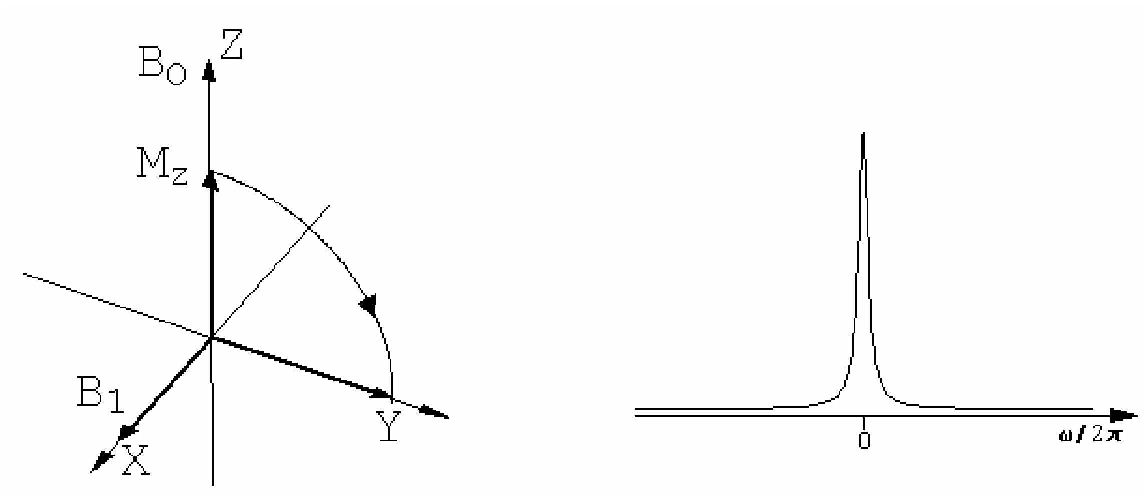
Calibration of 90^0 pulse.

One of the basic procedures is to calibrate the 90^0 pulse. Normally, the default value set up on our spectrometers is good enough to run daily experiments. However, if one would like to run two - dimensional experiments with complex pulse timing it is a good practice to calibrate the pulse.

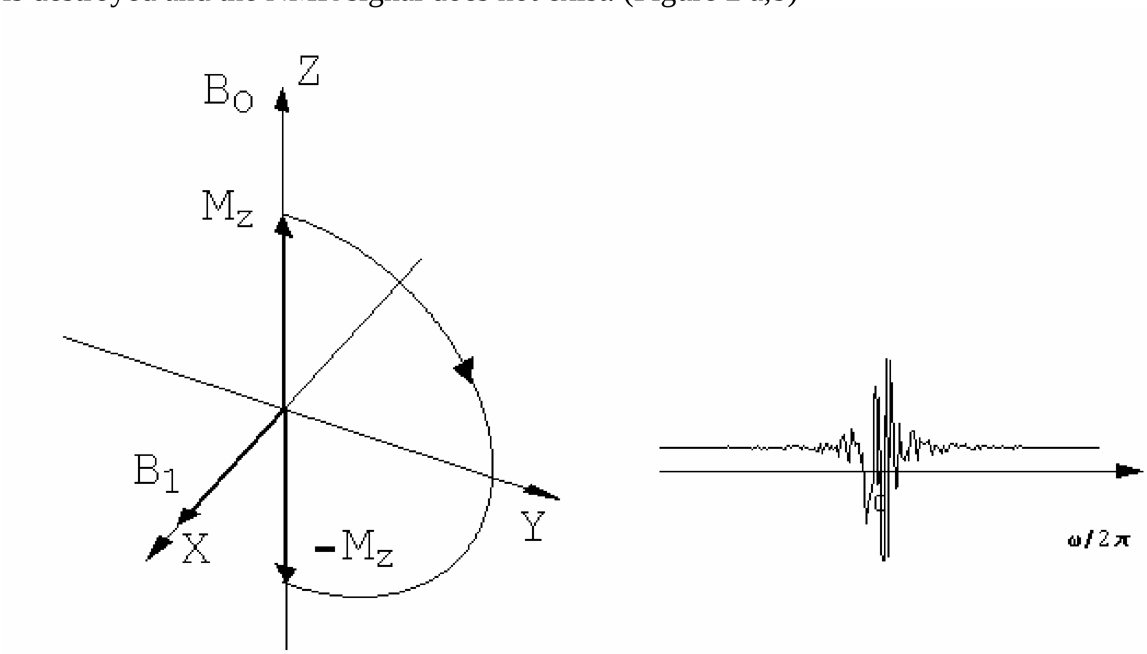
One of the ways is to find out the 180^0 and divide the time of the pulse by half. As we know after the 90^0 pulse the magnetization is transferred from the Z axis into the Y, creating coherence among spins yielding the NMR signal. Fig.1. a, b.



(a) **(b)**

Fig.1. The 90^0 pulse creates the coherence at xy plane (a) giving NMR signal (b)

The 180^0 pulse transfers the magnetization into the –Z direction where the spin coherence is destroyed and the NMR signal does not exist. (Figure 2 a,b)



(a) **(b)**

Figure 2. Magnetization M_z is inverted after 180^0 pulse (a), spin coherence does not exists giving no signal (b)

The Θ pulse angle follows the formula:

$$\Theta = \gamma B_1 t_p$$

where: γ - is the giromagentic ratio, B_1 - magnitude of RF field, t_p - the time interval of the pulse (On Bruker's software "p1").
One needs to adjust the "p1" time interval until NMR signal disappeared. The larger amplitude of noise in the place of peak is due to RF inhomogenity and other imperfections.

Experiment setup

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