Pulse calibration / nutation experiment

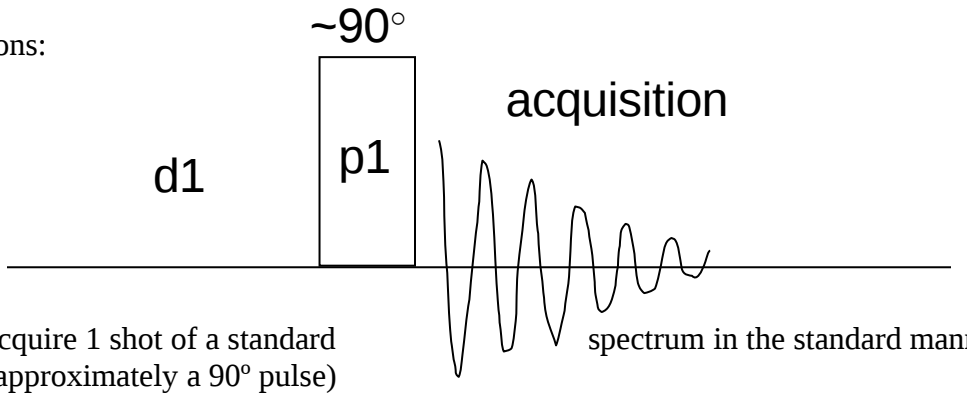
Last updated YB 19/5/03

I. The "quick and dirty" calibration: checking the 360º pulse

Theory: tip angle(θ_p) = pulse duration (p1) * pulse power (pl1)

Please leave the power level at the same value and adjust the tip angle via the pulse duration, p1.

Instructions:



(1) acquire 1 shot of a standard spectrum in the standard manner (approximately a 90º pulse)
   a. new, rpar 1H, lock, shim, ased (make sure the pulprog is zg)
   b. zg, ft, apk
   c. check the shim and optimize the parameters (set o1)
   d. zg, ft, apk
   e. you will reuse the same phasing parameters for the next step

(2) acquire 1 shot with four-times the pulse duration
   a. p1 <enter> N (change the value to 4*N to approximate 360º)
   b. zg, ftp
   c. if the residual line is up reduce p1 (µs)
      if the residual line is down increase p1 (µs)
   d. when there is no residual signal (or it's half –up/half-down)
      then you have rotated the signal by 360º, back where you started
      The correctly calibrated 90º pulse (p1) is ¼ of this value
      Check that running zg, ftp with the correct 90º pulse gives a large, positively phased signal.

(3) double check by acquiring the 90º pulse and processing with the same phase again
   a. p1 <enter> N (change the value to N/4 = 90º)
   b. zg, ftp
   c. if the phase is not pure absorption, repeat steps 1-3

(4) optional: triple check by acquiring the 180º pulse and processing with the same phase
   a. p1 <enter> N (change the value to 2*N = 180º)
   b. zg, ftp
   c. there should be no residual signal (or it's half –up/half-down)
   d. remember to return the pulse width, p1, to a 90º pulse

II. The full nutation experiment

Vary p1 in increments and observe the intensity as a function of p1. Always process the fid with the same phase parameters. The command "paropt" can be used conveniently for this purpose.

Type: paropt <enter>

Answer the questions. For example: p1, 5u, 5u, 20

The spectral region currently defined by dp1 is displayed in process 999 as a function of p1.

This should look like a sin wave. Choose the maximum intensity p1 as the 90º pulse.