

General preparation of TS:

Copy TS/wavemaker/shapes/excitation/cw file to TS/wavemaker/shapes/inversion/cw_i

Put r12 file into TS/wavemaker/shapes/phasecycles folder

wvm – Unix executable to be placed in Topspin/ext/stan/nmr/wavemaker/bin folder

Instructions for the L-WURST-CP experiment

1. Load any 1D experiment with f1- ^{15}N and f2 – ^1H then do “getprosol”.
2. Change the pulse program to “cp_wurst2.ekoff_ph_b1” for L-WURST-CP experiment.
3. Set the proper O1 and O2 frequencies depending on the sample. Cnst18 and cnst19 are the offset of CP block. If you want to apply CP on resonance, set the same values as O1p and O2p.
4. Set a proper decoupling during the acquisition using the parameters CPDPRG2, PCPD2, and PLW13
5. Set the WURST pulse parameters:
 - a. cnst21 – duration of ^1H WURST pulse in ms (e.g. 10 ms)
 - b. cnst22 – Sweep of ^1H WURST pulse in kHz (e.g. 10 kHz)
 - c. cnst23 – power level of ^1H WURST pulse in kHz (e.g. 2 kHz)
 - d. Automatically set the same duration and power of CW pulse on ^{15}N
6. CP contact time is controlled by l2 (number of loops). Set a proper l2 to reach to the maximum sensitivity.
7. Type the command “wvm_x -a” to create all the pulses and update acquisition parameters.
8. Start the experiment.

Instructions for the TAPF-CP experiment

1. Load any 1D experiment with f1- ^{15}N and f2 – ^1H then do “getprosol”.
2. Change the pulse program to “cp_wvm_cwr12.ekoff” for the TAPF-CP experiment.
3. Set the proper O1 and O2 frequencies depend on the sample. Cnst18 and cnst19 are the offset of CP block. If you want to apply CP on resonance, set the same values as O1p and O2p.
4. Set a proper decoupling during the acquisition using the parameters CPDPRG2, PCPD2, and PLW13
5. Set the CP pulse parameters:
 - a. cnst22 – pulse duration of each phase cycle on ^1H channel (e.g. 25 us)
 - b. cnst23 – pulse duration of CW pulse on ^{15}N channel (e.g. 300 us)

Note that the `cnst23` equals $12 \times \text{cnst22}$ since the current pulse sequence was designed to use the phase cycle of $(+x/-x/+x)_{x4}$.

6. Set the proper CP contact time in `d9`
7. Type the command `"wvm_x -a"` to create all the pulses and update acquisition parameters
8. If the CP power level of ^{15}N channel is too high, change the `cnst22` and `cnst23` then do `"wvm_x -a"`
9. Start the experiment

When setting up experiments for the first time, `ased` will complain that it doesn't contain necessary pulses – just do `"wvm_x"` which will create pulses using default parameters and will allow you to go through pulse parameters. Don't forget to do `"wvm_x -a"` at the end again if you change any parameters related to wavemaker, such as `cnst21`, `cnst22`, or `cnst23`.