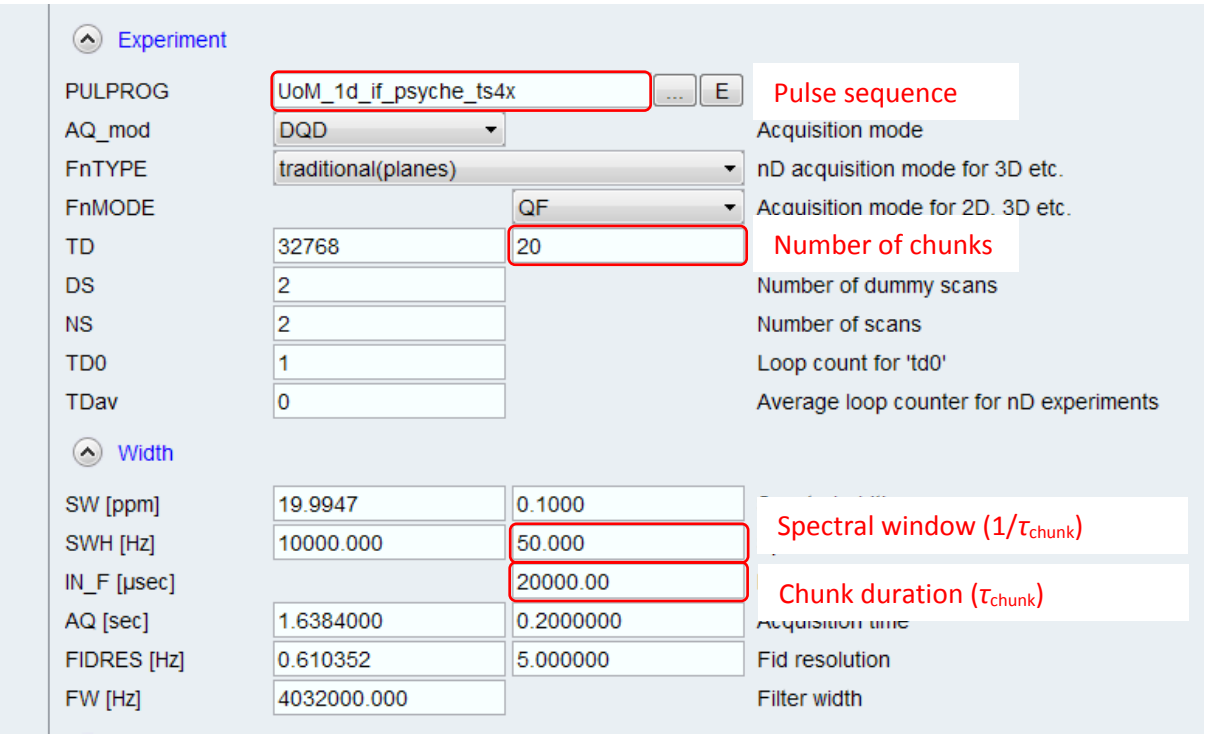
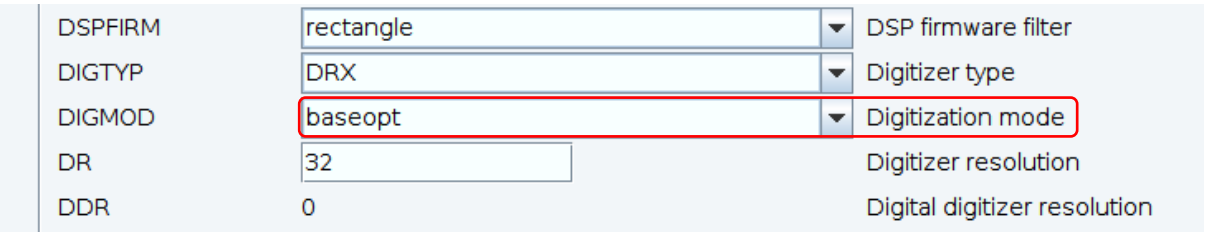
1D PSYCHE:

Generate a new 2D experiment and proceed as follows. In the acquisition parameter set, by typing *eda*, set the acquisition parameters. The pulse sequence should be stored in the main directory of topspin program, under: *~TopSpinx.xplx/exp/stan/nmr/lists/pp/user*



Set DIGMOD to *baseopt*.



Type *ased* in the topspin command-line and set the rest of pulse sequence dependent parameters. Set drop-points and gradient recovery deley. Use at least 1 ms for the gradient recovery delay. (*d16*)

PULPROG	UoM_1d_if_psyche_ts4x ... E		Pulse program for acquisition
TD	32768		Time domain size
SWH [Hz, ppm]	10000.00	19.9947	Sweep width
AQ [sec]	1.6384000		Acquisition time
RG	32		Receiver gain
DW [µsec]	50.000		Dwell time
DE [µsec]	6.50		Pre-scan-delay
CNST4	4.0000000		Number of drop points
D0 [sec]	0		Incremented delay
D1 [sec]	2.000000000		Relaxation delay
D16 [sec]	0.001000000		Recovery delay for gradients
DS	2		Number of dummy scans
in0 [sec]	0.01000000		1/(2 * SW) = DW
INF1 [µsec]	20000.00		Increment for F1

The parameters set so far are common in all 1D interferogram experiments (BIRD, ZS, BS, and PSYCHE). The followings are specific to the PSYCHE experiment.

Set the appropriate flip angle and the bandwidth (according to the waveform) for the PSYCHE pulse element. The pulse sequence uses these parameters to calculate the corresponding r.f. amplitude of the pulse.

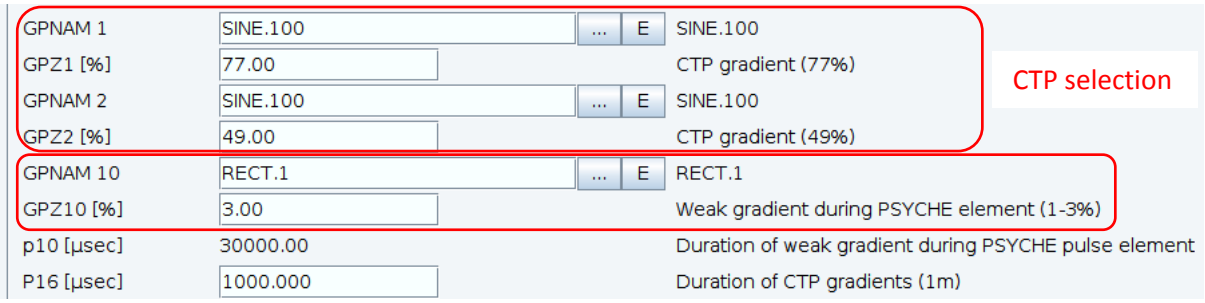
SFO1 [MHz]	500.1325006		Frequency of ch. 1
O1 [Hz, ppm]	2500.65	5.000	Frequency of ch. 1
NUC1	1H Edit...		Nucleus for channel 1
CNST20	15.0000000		Desired flip angle for PSYCHE pulse element (degree) (normally 10-25)
CNST21	10000.0000000		Bandwidth of each chirp in PSYCHE pulse element (Hz) (normally 10000)
cnst31	270000.000000		cnst31= (p30/p1) * (p30/p1)
cnst50	48.112522		cnst50=(cnst20/360)*sqrt((2*cnst21)/(p40/2000000))

PSYCHE pulse parameters

Set the PSYCHE pulse shape and its duration. The rf power will be calculated automatically based on the parameters bandwidth, flip angle, and the pulse duration. The wave should be stored in the main directory of topspin program, under: *~TopSpinx.xplx/exp/stan/nmr/lists/wave/user*

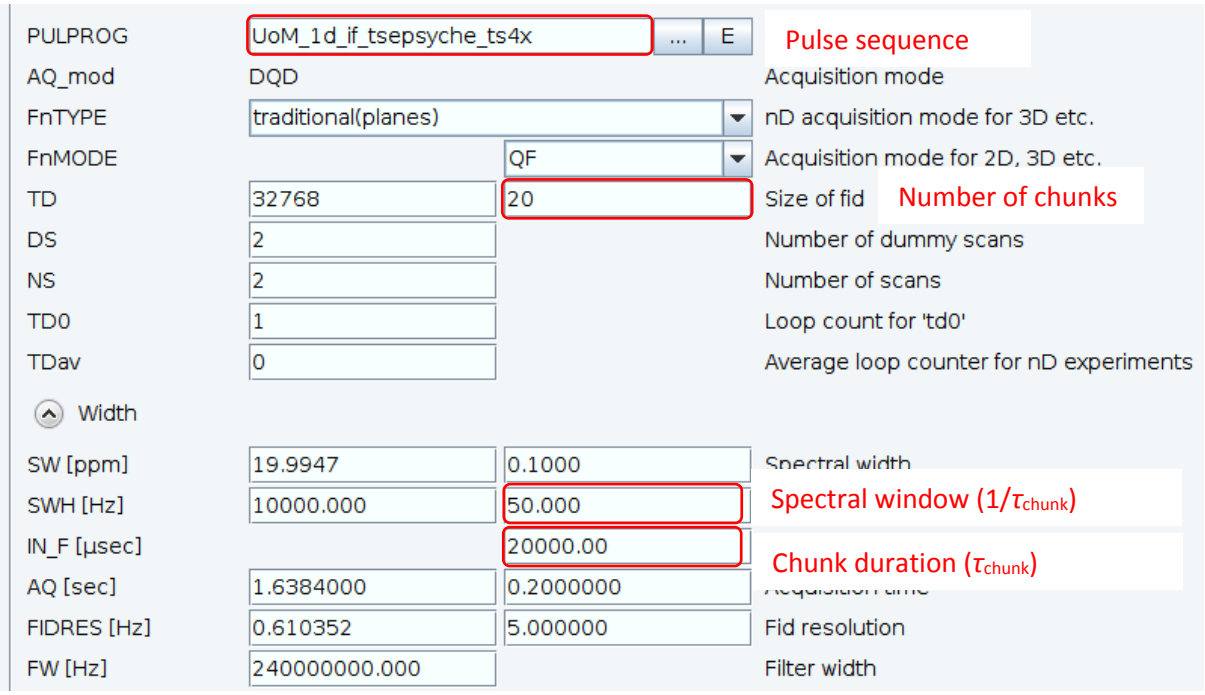
P40 [µsec]	30000.000		Duration of double-chirp PSYCHE pulse element
PLW0 [W, dB]	0	1000.00	Zero power (120 dB)
PLW1 [W, dB]	25.267	-14.03	High power (dB)
SPNAM 40	PSYCHE_Saltire_10kHz_30m ... E		File name for PSYCHE pulse element
SPOAL40	0.500		Phase alignment of freq. offset in SP40
SPOFFS40 [Hz]	0		Offset frequency for SP40
spw40 [W, -dBW]	9.3581e-05	40.29	RF power of double-chirp PSYCHE pulse element

Set the gradient shapes and amplitudes for PSYCHE and CTP selection.

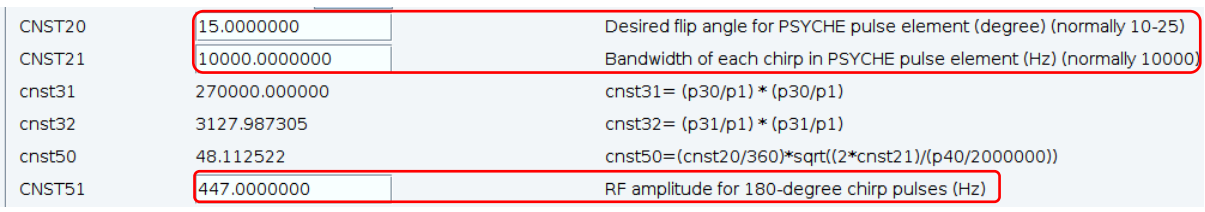


1D TSE-PSYCHE:

The general setup of 1D TSE-PSYCHE is the same as 1D PSYCHE, but two more chirp pulses and two more weak gradients are needed.



Set the appropriate flip angle and the bandwidth (according to the waveform) for the PSYCHE pulse element. The pulse sequence uses these parameters to calculate the corresponding r.f. amplitude of the pulse. Set the r.f. amplitude for the 180-degree chirp pulses. This information can be found in the name of the shape.



Set the PSYCHE pulse shape and two 180-degree chirps and their durations. The rf power will be calculated automatically based on the parameters bandwidth, flip angle, and the pulse duration for PSYCHE pulse, and based on the pulse duration and the provided r.f. amplitude for the 180-degree chirps. All waves should be stored in the main directory of topspin program, under *~TopSpinx.xplx/exp/stan/nmr/lists/wave/user*

P40 [µsec]	30000.000			Duration of double-chirp PSYCHE pulse element
P41 [µsec]	40000.000			Duration of 1st 180-degree swept-frequency pulse
P42 [µsec]	40000.000			Duration of 2nd 180-degree swept-frequency pulse
PLW0 [W, dB]	0	1000.00		Zero power
PLW1 [W, dB]	25.267	-14.03		High power
SPNAM 40	PSYCHE_Saltire_10kHz_30m	...	E	File name for PSYCHE pulse element
SPOAL40	0.500			Phase alignment of freq. offset in SP40
SPOFFS40 [Hz]	0			Offset frequency for SP40
spw40 [W, -dBW]	9.3581e-05	40.29		RF power of double-chirp PSYCHE pulse element
SPNAM 41	Chirp10kHz40m20s447Hz10000LH	...	E	File name for 1st 180-degree swept-frequency pulse
SPOAL41	0.500			Phase alignment of freq. offset in SP41
SPOFFS41 [Hz]	0			Offset frequency for SP41
spw41 [W, -dBW]	0.0080777	20.93		RF power of 1st 180-degree swept-frequency pulse
SPNAM 42	Chirp10kHz40m20s447Hz10000HL	...	E	File name for 2nd 180-degree swept-frequency pulse
SPOAL42	0.500			Phase alignment of freq. offset in SP42
SPOFFS42 [Hz]	0			Offset frequency for SP42
spw42 [W, -dBW]	0.0080777	20.93		RF power of 2nd 180-degree swept-frequency pulse

Set the gradient shapes and amplitudes for PSYCHE and CTP selection.

GPNAM 1	SINE.100	...	E	SINE.100
GPZ1 [%]	35.00			CTP gradient (35%)
GPNAM 2	SINE.100	...	E	SINE.100
GPZ2 [%]	49.00			CTP gradient (49%)
GPNAM 3	SINE.100	...	E	SINE.100
GPZ3 [%]	77.00			CTP gradient (77%)
GPNAM 10	RECT.1	...	E	RECT.1
GPZ10 [%]	3.00			Weak gradient during PSYCHE element (1-3%)
GPNAM 11	RECT.1	...	E	RECT.1
GPZ11 [%]	2.00			Weak gradient during 1st 180-degree chirp (1-3%)
GPNAM 12	RECT.1	...	E	RECT.1
GPZ12 [%]	2.00			Weak gradient during 2nd 180-degree chirp (1-3%)
P16 [µsec]	1000.000			Duration of CTP gradients (1m)

CTP selection

Covariance processing for F_1 PSYCHE-TOCSY:

In the topspin command-line type *covariance man* and proceed as follows.