

Everything you've ever wanted to know about tuning the NMR, but were afraid to ask

From complete shutdown:

- Turn on the water chiller to temperature-stabilize the Q-meters
- Turn on the Q-meter power supply
- Turn on the RF generator (in our case, the Rhode and Schwartz)
- Turn on the Digital Patch Panel
- Connect the appropriate $\lambda/2$ cable to the circuit (connects the Q-meter to insert)
- Make sure a phase cable is present (top of the appropriate Q-meter)
- Activate the oscilloscope
 - X-channel = DAC0OUT
 - MODE = CH2
 - CH1 = DC
 - CH2 = DC (sometimes AC)
 - SEC/DIV knob all way to the left (X-Y)
- Bring up the “TPS System Start” LabVIEW program and select the “Minimal Configuration” setting
 - Select the appropriate NMR channel
 - Change the number of sweeps to something reasonable (Ex: 500sweeps)
 - Put the program into “Take Data” mode
- A signal should appear on the oscilloscope. If you cannot see it, try fiddling with the Volts/div knob. If the signal still does not appear, consult a higher ranking lab officer
- Tune the diode
 - Connect the Y-channel to the corresponding diode (Ex: Q-meter 1 => Diode 1)
 - Insert a small screwdriver (preferably plastic) into the appropriate Q-meter and turn the screw until the signal on the oscilloscope is a symmetric curve or as close to a symmetric curve as it will get. Remove the screwdriver
 - Adjust knob on the appropriate Q-meter for fine-tuning the signal.
- Once satisfied with the diode curve, proceed to tune the phase
 - Connect the Y-channel to the corresponding ACH (Ex: Q-meter 1 => ACH0)
 - Adjust the VOLT/DIV knob until a curve appears. If a flat line is seen, run the Yale DC Convert LabVIEW program. If the line is still flat, consult a higher ranking lab officer.
 - Once a curve is present on the oscilloscope, add/remove phase cable until a symmetric curve (or as close to it as is humanly possible) is achieved. Avoid using phase adjustors. If curve is low on the right -> Add cable
- Once satisfied with the phase curve, switch back to the diode to make sure that it is still tuned