

Getting started on the CW-NMR Expt:

1. To cool the magnet power supply (Varian V2901), there is a re-circulating water system that must be turned on. On the wall in back of the magnet, there are two valves, labeled “supply” and “return”, and both *must* be fully opened. (There is also a third valve which is labeled “do not change”). In addition, there is also a re-circulating pump which must be plugged in. The TA or Prof. will assist you in doing this step because the power supply is irreplaceable and burning it up is not an option.
2. Check that the magnet current knob (labeled as *current adjust*) on the Varian V2901 power supply is at zero. Then, push the red button.
3. Turn on the following equipment:
 - a. XY- oscilloscope monitor
 - b. Tektronix digital oscilloscope
 - c. HP 5 3131A frequency counter
 - d. Bell 9500 Gauss meter
 - e. Exact 7050 function generator
 - f. PAR 5113 preamp
 - g. Transistorized Marginal oscillator (small tan box at knee level with probe attached).
4. Place a sample of $\text{H}_2\text{O} + \text{CuSO}_4$ into the probe head, since this sample will have a strong resonance. Now, adjust the oscillator frequency to ≈ 9.4 MHz.
5. Slowly increase the magnet current on the Varian V2901 power supply. At around 35 amps, you should see the traditional NMR signal on the X-Y monitor scope.
6. Symmetrize the resonance in the X-Y monitor display by carefully adjusting the magnet current.
7. Move the NMR probe around the gap between the pole faces until the signal maximizes. You will need to shim the back of the marginal oscillator box to achieve this maximum.
8. Adjust the *Oscillator Current Control* to optimize the combination of signal amplitude and background noise. If you go too far, the marginal oscillator tries to stop oscillating.
9. The digital scope should have CH1 with the triangle wave that sweeps the magnet, CH2 with the NMR signal from the preamp, and the “ext. trig” as the *sync out* of the function generator. You should be able to see a figure similar to that shown in Fig. 5 of the writeup. Now, proceed with Exercise I.