

EPR Spectrometer Operating Instructions *revised 10/2/09 DZH*

1. Switch ON
 - a. Water and Temperature Controller
 - b. Computer and display
 - c. Console
 - d. Pre-amp
 - e. Set field on console from off to 0 on x10000 to turn on magnet power
2. TUNE
 - a. Wipe sample capillary with kimwipe if necessary, and place sample in loop gap resonator and tighten slightly
 - b. Turn klystron bridge dial to tune
 - c. When tuning, keep power low, around 0.1 mW
 - d. Find resonator "dip" by adjusting frequency and iris
 - e. Use frequency and iris to tune dip into middle of oscilloscope to give max dip
 - f. DET current should never be high – could damage diodes, turn power down
 - g. Check tuning with reference arm – turn reference arm to ABS, should be proportionally the same as when it is turned off, use phase on bridge to adjust when necessary (may need to decrease power)
3. OPERATE
 - a. Turn klystron bridge dial to OPER. Increase power and adjust frequency and iris so that AFC out and Det curr are both zero, by using frequency to make AFC output zero and iris to make DET current zero. Continue to do this up to 2 mW (to about 50 mW for power saturation experiments).
 - b. Turn power down to 2 mW.
 - c. Turn Ref arm to ABS. Increase DET curr, needs to be between 150-250 uA to give best signal, use Ref power with screwdriver and iris to adjust.
 - d. Adjust gain to maximize signal (height of peak).
 - e. Adjust field set to center signal on screen.
 - f. Check that sample is out of phase at 90°, must be flat line, if not adjust phase with phase control on console
4. OBTAIN SPECTRUM
 - a. Pull up Sigav130.vi software
 - b. Adjust scan time, number of scans
 - c. Correct base line with output zero on console
5. TURNING OFF SPECTROMETER
 - a. Decrease power to "MIN"
 - b. Turn Reference arm to OFF
 - c. Klystron to STBY
 - d. Remove sample
 - e. Turn off pre-AMP
 - f. Turn off field set (from zero to OFF)
 - g. Turn off power
 - h. Turn off water and Temperature Controller
6. NORMAL SETTINGS

Bridge:
AFC – Normal, Power – leveled, Power Switch – mW, AFC modulation – 5 (loop gap resonator), 1 (cavity resonator)

Field Controller Panel:
Scan range – 100 Gauss, lever – Computer

Low Frequency Panel:
Receiver Gain – 2.5, Modulation Amplitude – 1.00, Time Constant – out

Function Selector Panel:
Oscilloscope Monitor – high freq, Cavity Modulation – II low/ I high, Recorder Input – high freq

High Frequency Panel:
Function – 100 kHz, Modulation – 1.0, Limit – 1, Time Constant – 0.128

Oscilloscope Panel:
Filter – A, Field Sweep - Off