PHYS3710 Short experimental projects I

Department of Physics

The Chinese University of Hong Kong, Hong Kong

Topic: Continuous Wave Nuclear Magnetic Resonance (CWNMR)

Topics you should know first:
Nuclear magnetic resonance

Objectives:

1. Understand the equipment setup (Gauss meter, marginal oscillator, modulation coil, phase shifter, frequency counter and oscilloscope).
2. To measure the resonance frequency of $CuSO_4$ under different magnetic field.
3. To measure the resonance frequency of $Mn(NO_3)_2$ under different magnetic field.
4. To calculate the g factor of proton.

Check-list for the project:

1. Read references 1. Understand the relevant theory and equations.
2. Setup the pieces of equipment according to reference 1.
3. Learn the techniques of obtaining optimized continuous wave nuclear magnetic resonance signals.
4. Measure the resonance frequency of $CuSO_4$ under different magnetic field
5. Measure the resonance frequency of $Mn(NO_3)_2$ under different magnetic field.
6. Calculate the g factor of proton using measurements from 4.

References:

1. Nuclear magnetic resonance (NMR) lab manual.
2. Marginal oscillator (Leybold ESR basic unit & ESR adapter) operation manual.
3. Frequency counter (Optoelectronics M1 frequency counter) operation manual.
4. Oscilloscope (Hitachi V-211 V-212) operation manual

Reference folder is available.