Experimental Doubts and Updates

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**Doubt 1:**

For ST-FMR, the experimental setup and the LabView program is ready, the only problem is our power supply is not measuring the DC of the Bias tee. Instead of connecting to the power supply, I connected it to a lab multi-meter, and swept frequency from 1 GHz to 9GHz, the multi-meter read from 200mV to 10mV. I think the problem is, our power supply (PS) does not act as digital voltmeter. It has two modes: Source mode and Sink mode. Whenever more current (more the current limit set in the power supply) flows into the PS, it goes into sink mode (becomes red and negative sign is present in the current) and starts measuring the voltage. In the ST-FMR test runs (without the sample), may be less than 1mA current is flowing into the PS (1mA is minimum current limit can be set), hence it is not going into sink mode. What should I do? I’m thinking of using the SMU for measurement automation, LabView for ST-FMR using SMU is also ready.

**Doubt 2:**

For ST-FMR, at first, we have to magnetize the sample and then we will put it in the waveguide and sweep the frequency.

1. At what DC field should the sample be magnetized
2. What should be the frequency range for sweeping

**Doubt 3:**

For reference signal to be generated from the electromagnet, I took some coil available in the lab (not the one bought from amazon). Made two circular coils of radius 1.5mm, made few turns and pasted them on the poles of the electromagnet. I connected both the coil in series. On giving around 200mT, I am reading about 2-3uA current, for a small period (time from starting the dc field till it reaches 200mT). I don’t see any constant current in the coil, even after the DC field is maintained. I think, the current, which is reading, is because of the Lenz’s law. Because when the DC field goes from 0 to 200mT, the current is negative and when the DC field goes from 200mT to 0, the current is positive. In such case, how we can generate a stable reference signal for the Lock-in?