Testing fsNMR with a Standard CH2-G14 Cell in cold PD-1

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HDice-DSG meeting

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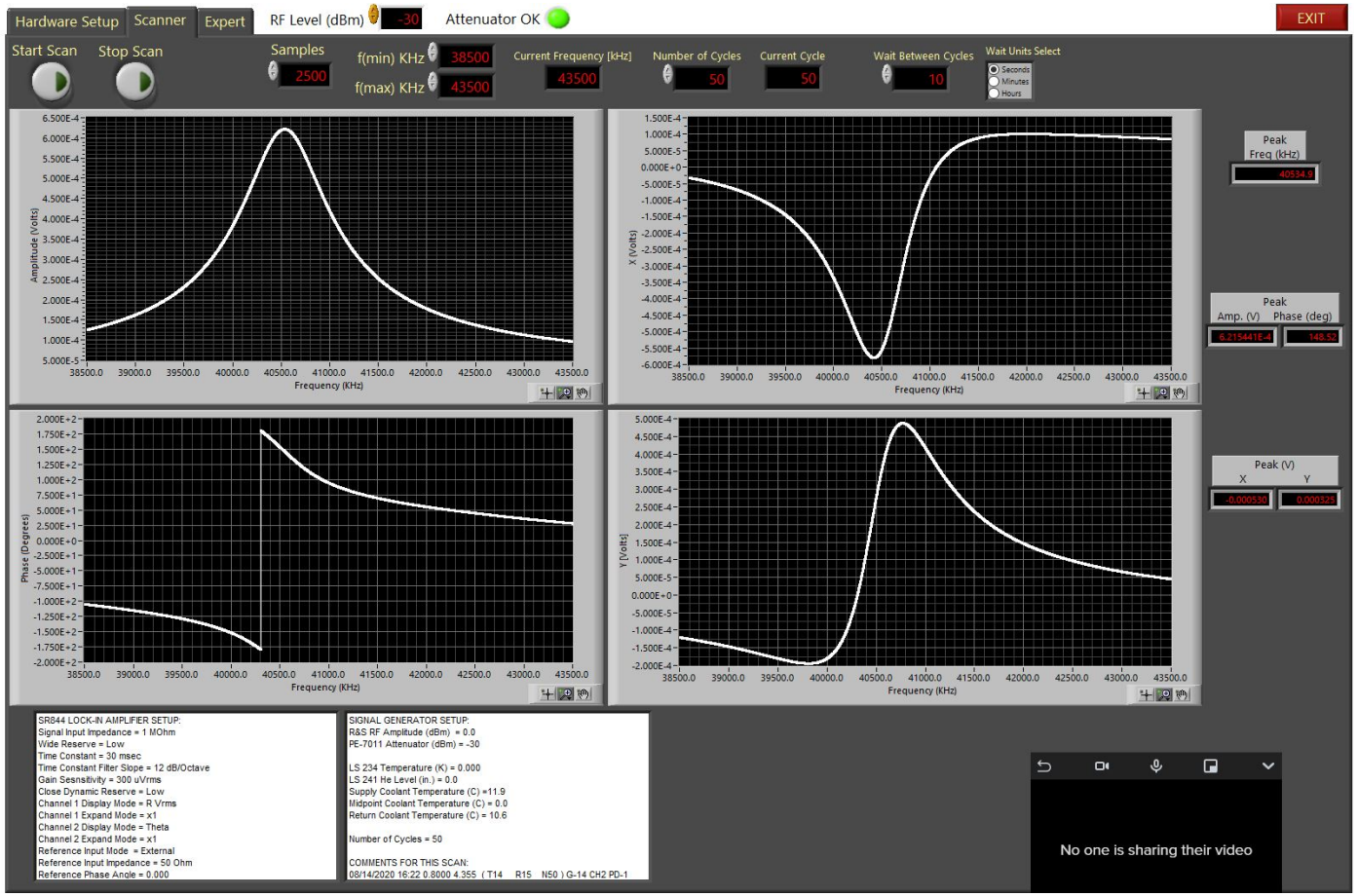
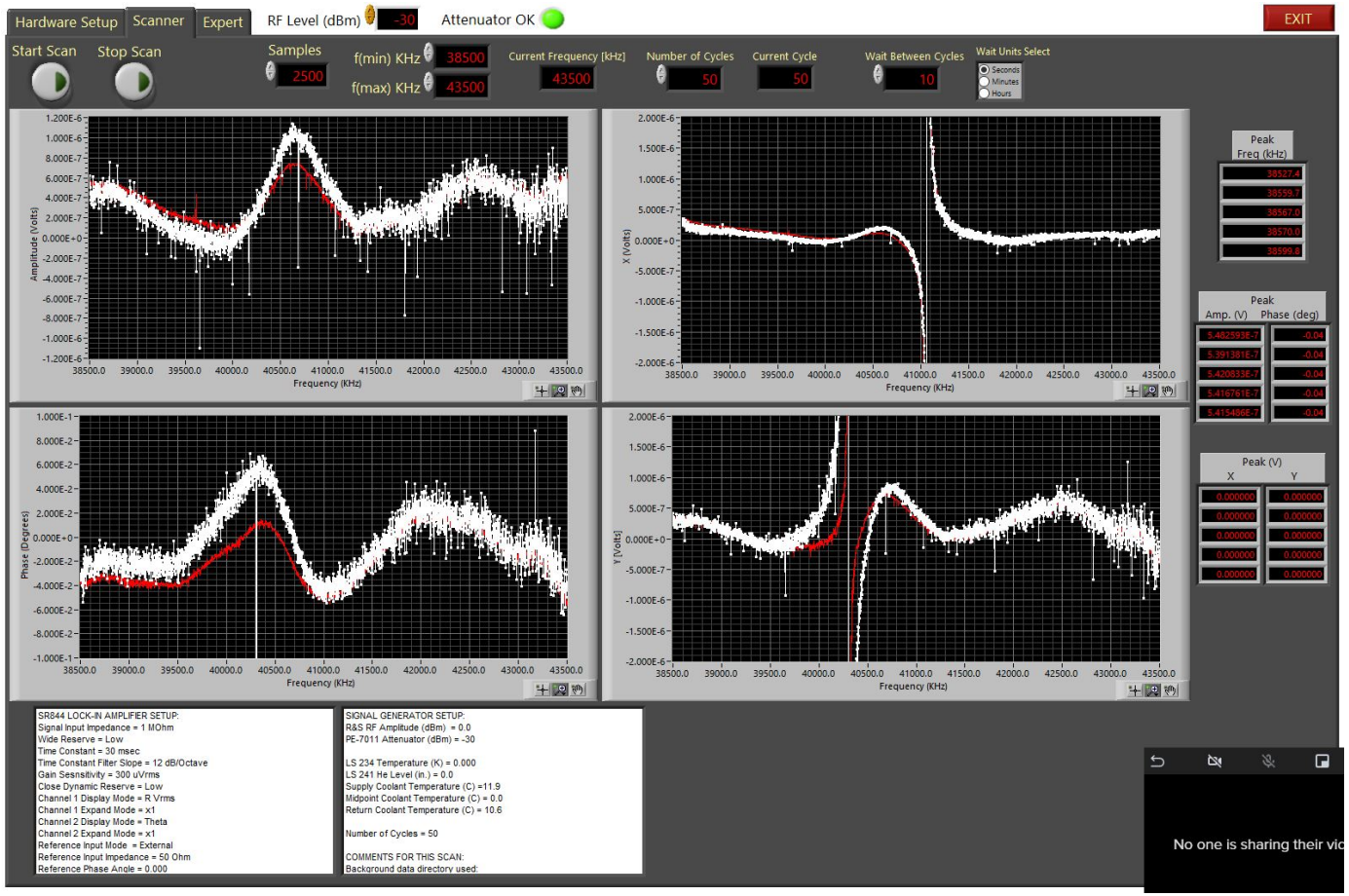
- The fsNMR program has been tested in cold PD-1 with a standard G14 size CH2 target cell for a week.
- Real NMR signals were measured in different conditions.
- In order to see the proton signal, which is a very small fraction of the detected RF signal at 4K and 1 tesla, the frequency swept ranges were shifter away from the “zero crossing” of X and Y channels. This situation will be eliminated when we implement the normalization with the RF amplitude curve, R.

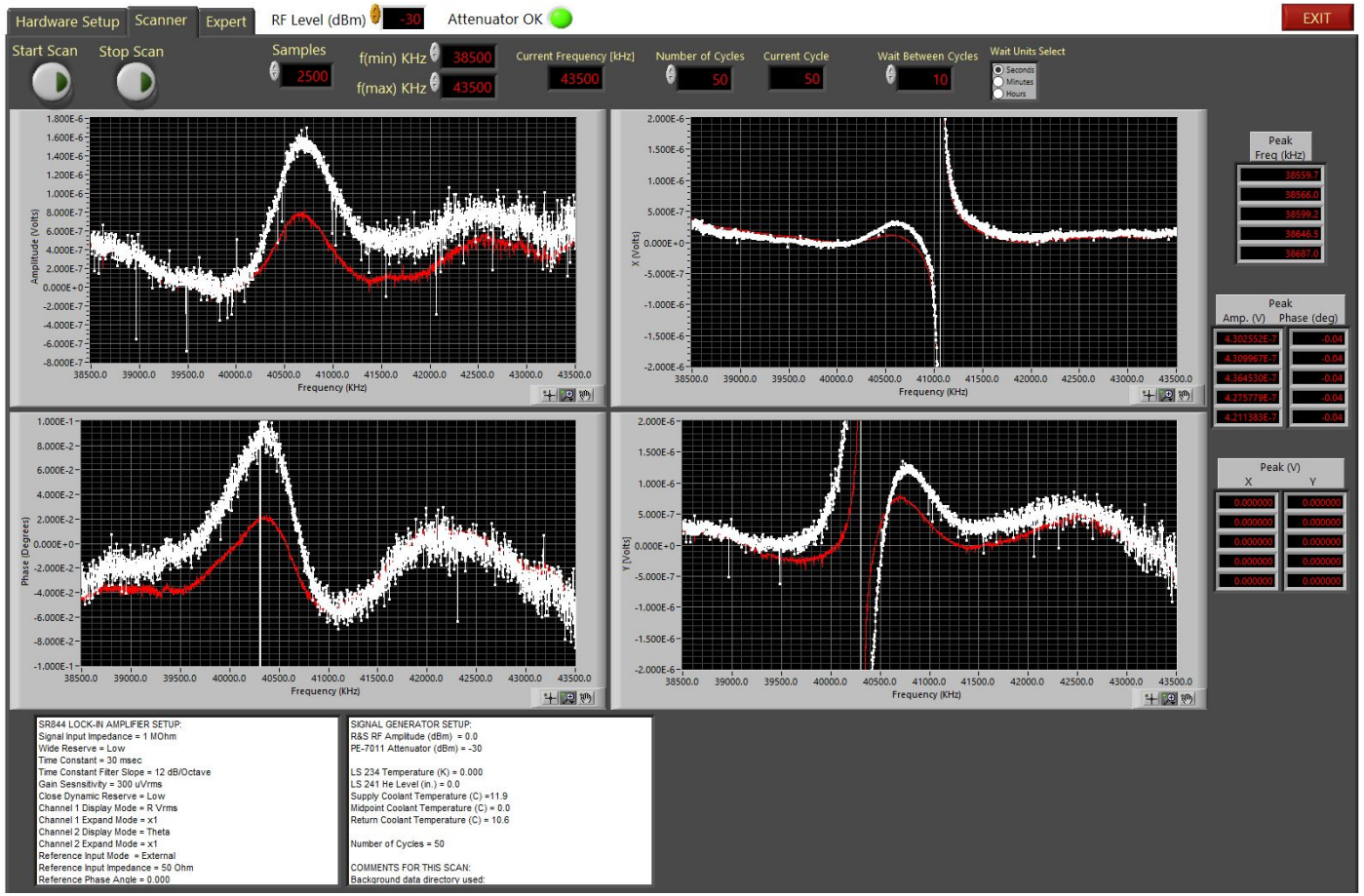
Measured RF amplitude curve, R, as the NMR background



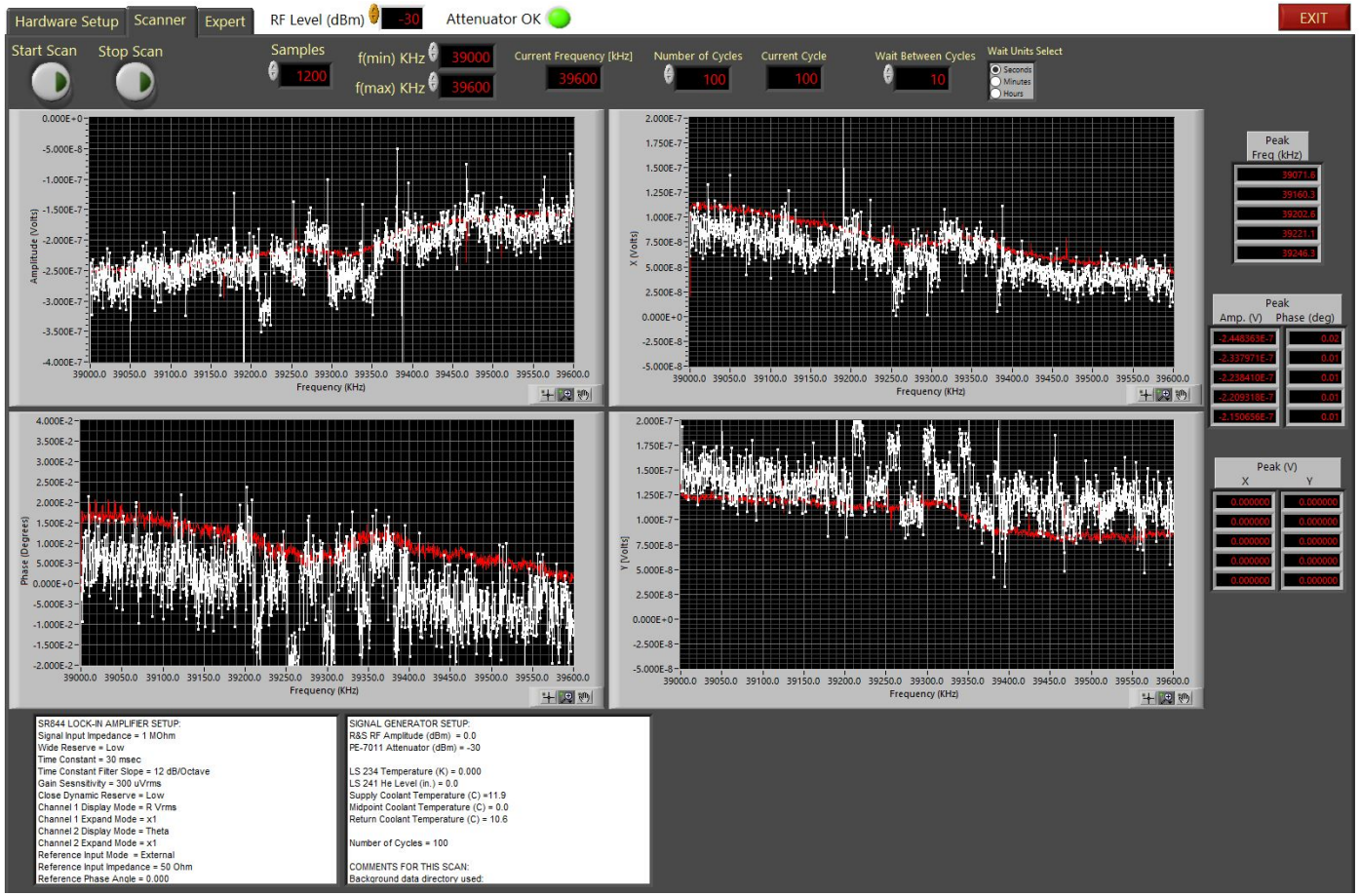
Measured NMR signals with -30dBm at ~41350kHz, (S~10^{-8}V, covered by the noise) and 0.9747Tesla.



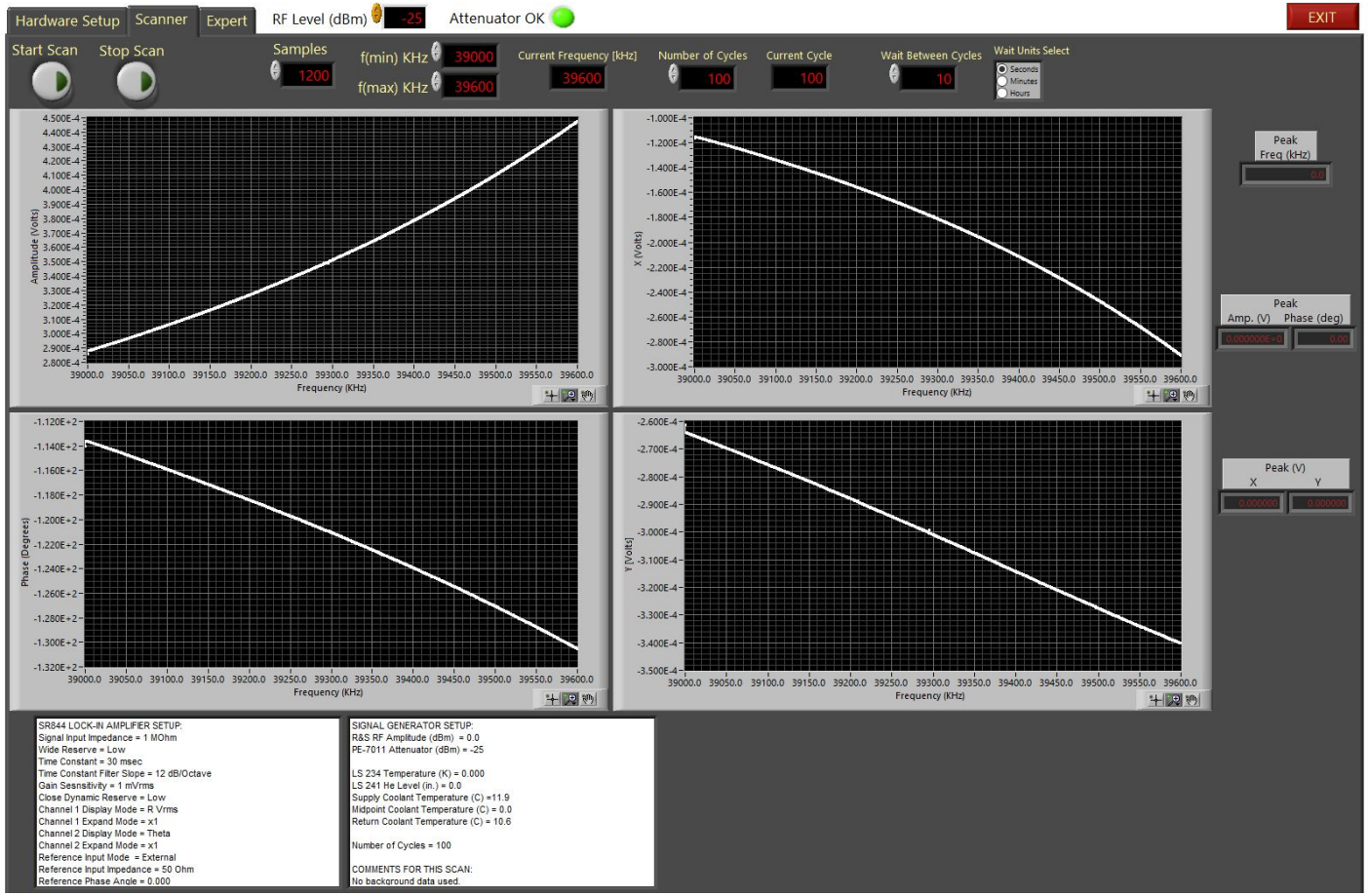
Measured NMR signals with -30dBm at ~40350kHz, and 0.9277Tesla. (the signal can be seen as the small wiggle on phase plot)



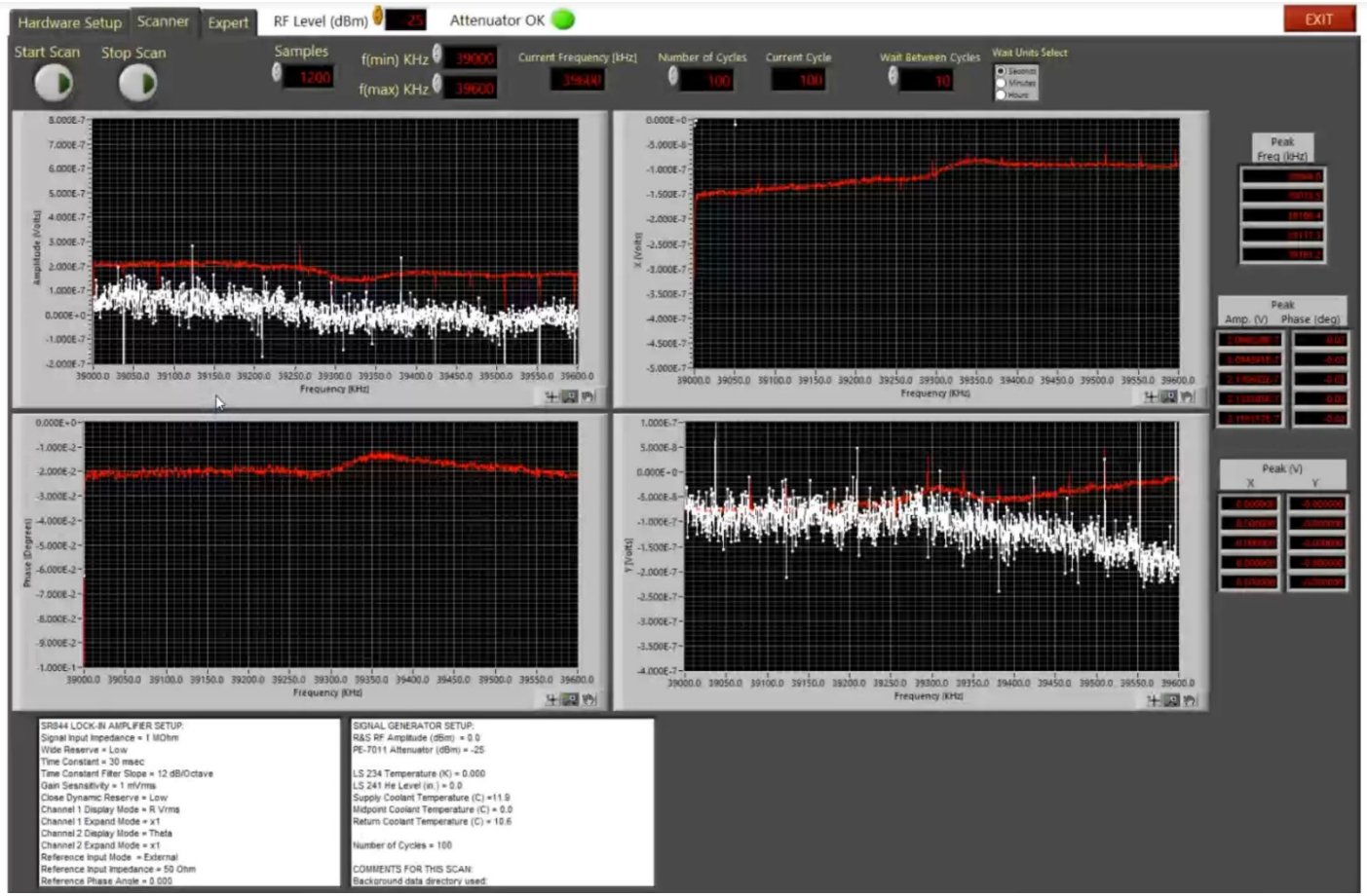
Zoomed in the RF frequency with -30dBm (S~10^{-8}V, covered by the noise) and 0.9277Tesla. The averaged signals can be seen, behind live trace, in all 4 plots.



To improve S/N, background signal was measured at -25dBm and 0.8000Tesla. *The tiny jump at the left edge was the reason to skip some points when determining maximum for data normalization.*



NMR Signal was measured with -25dBm and 0.9277Tesla. The S/N was clearly improved (The potential cost would be more polarization used). The RF jumps, seen more clearly in the previous picture, posed less of the problem now.



The fsNMR reviewer program are being tested. Here shows the -30dBm at 0.9277T plots.