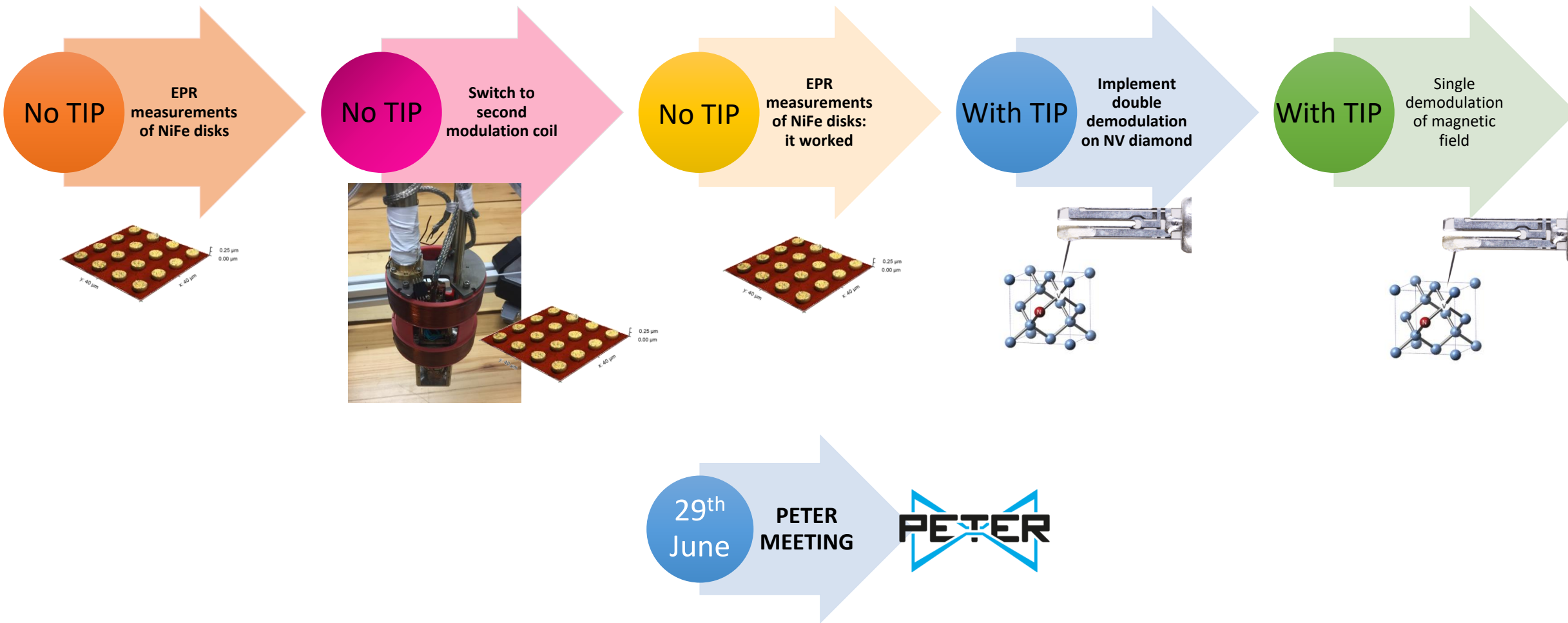


**Universität  
Stuttgart**

# Progress on **PETER** Project

**UNISTUTT**

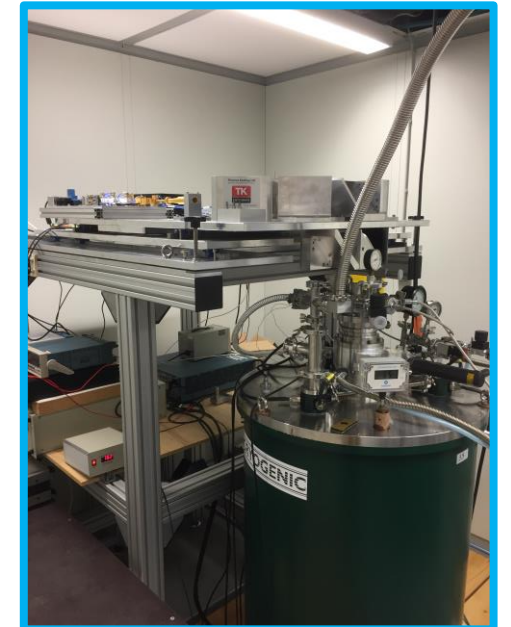
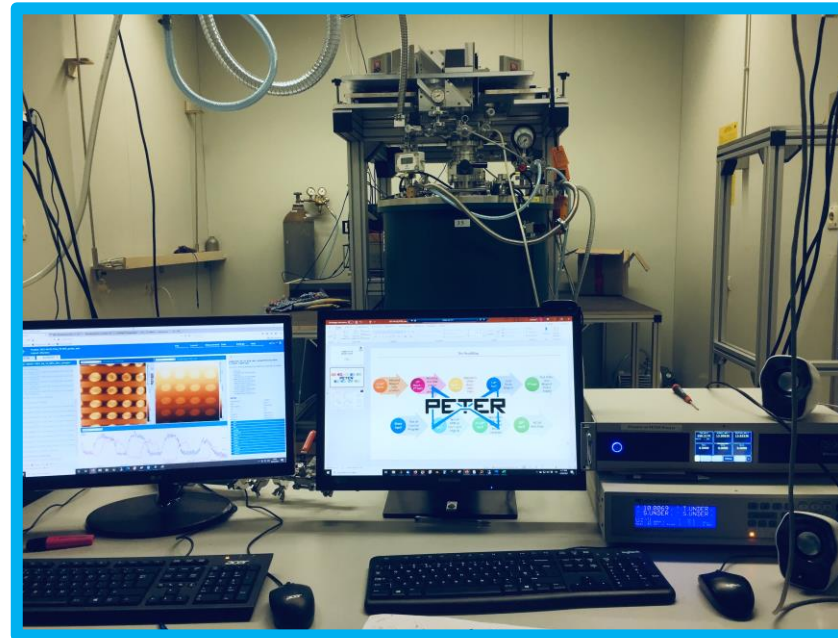
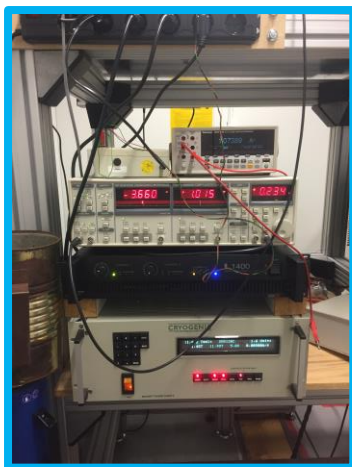
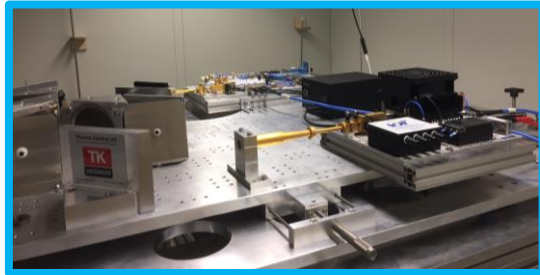
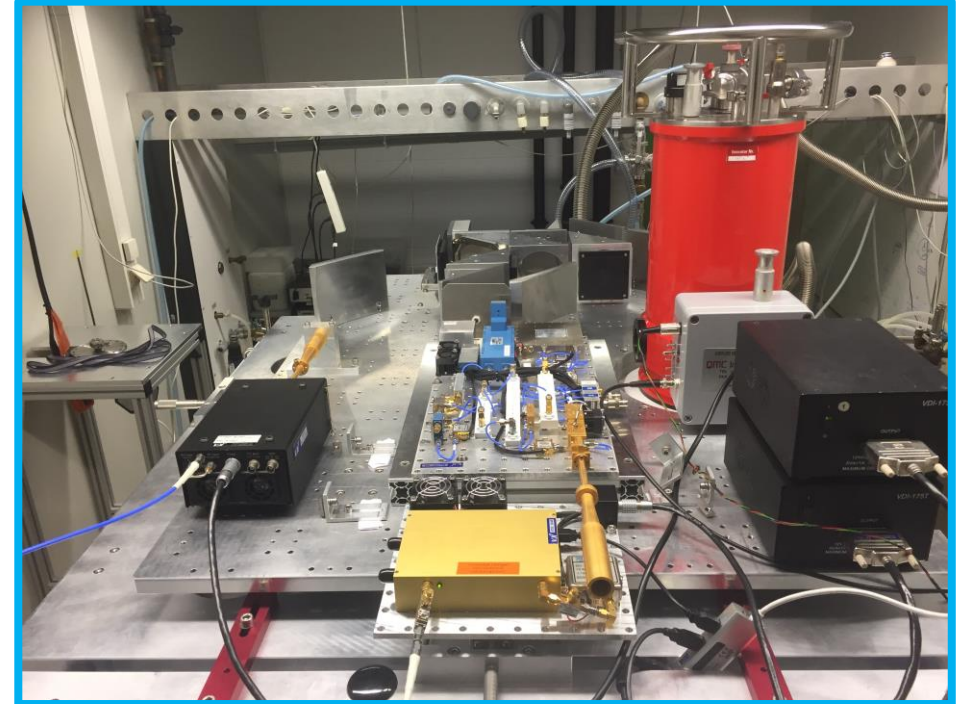
**29<sup>th</sup> of June 2021**



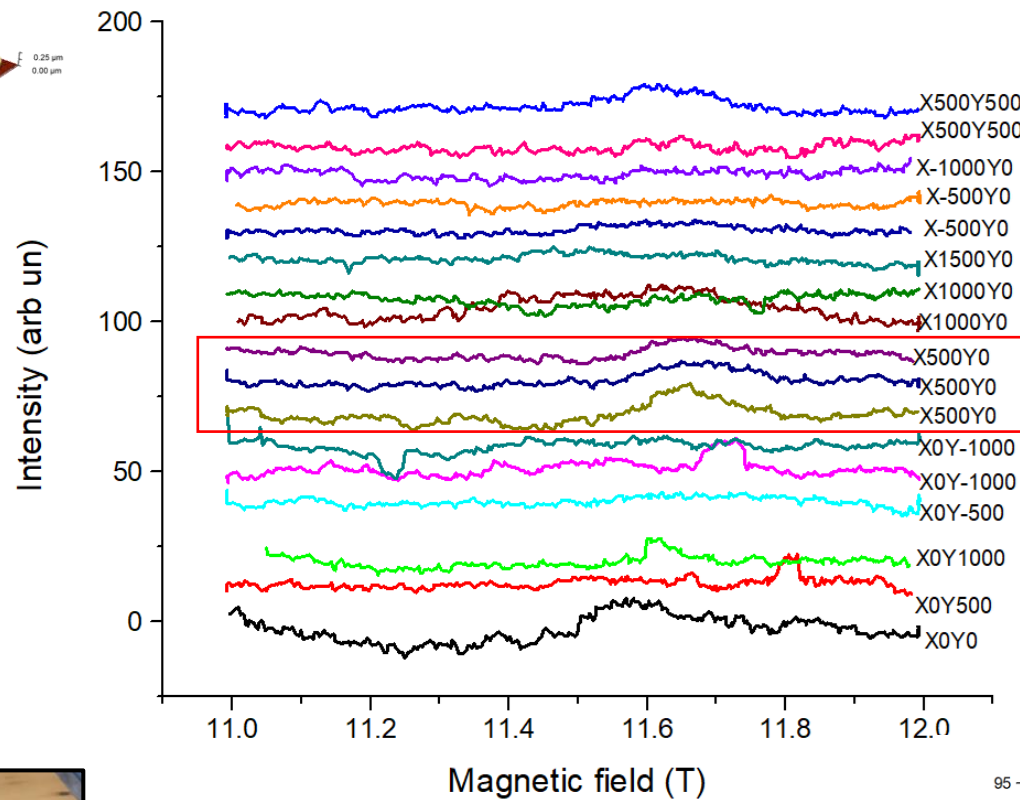
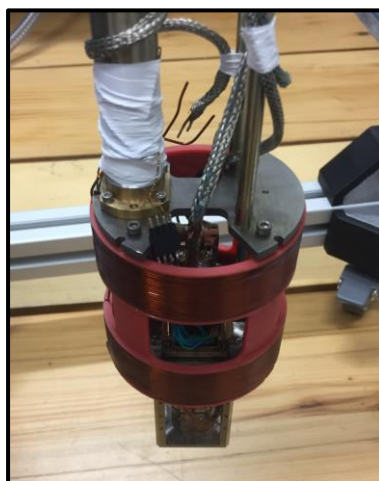
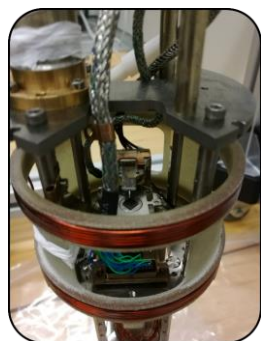
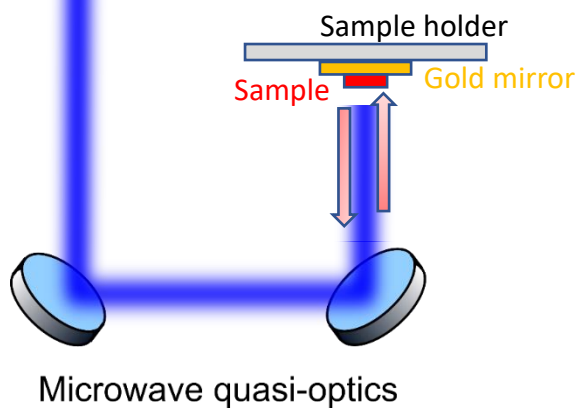
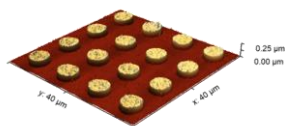
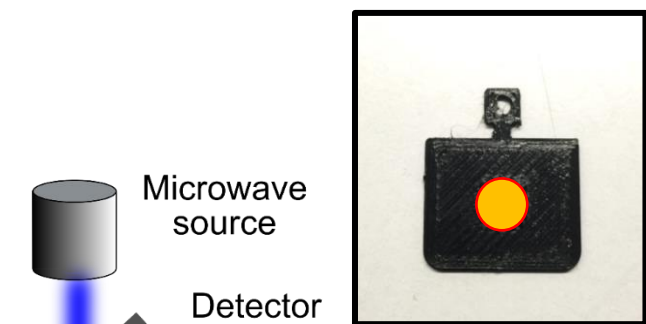
# PETER LAB

Currently

Previously



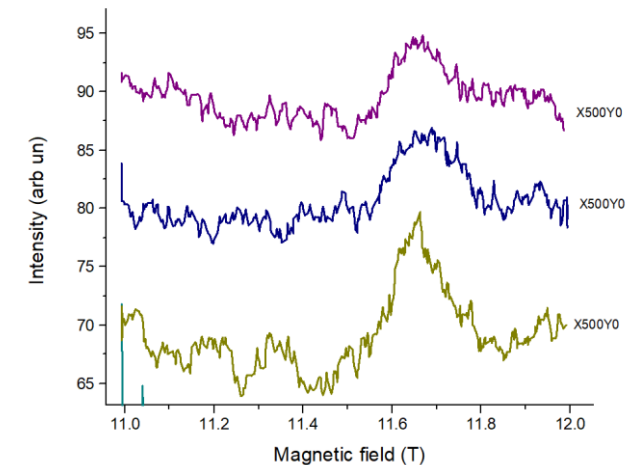
# EPR measurements at different sample positions



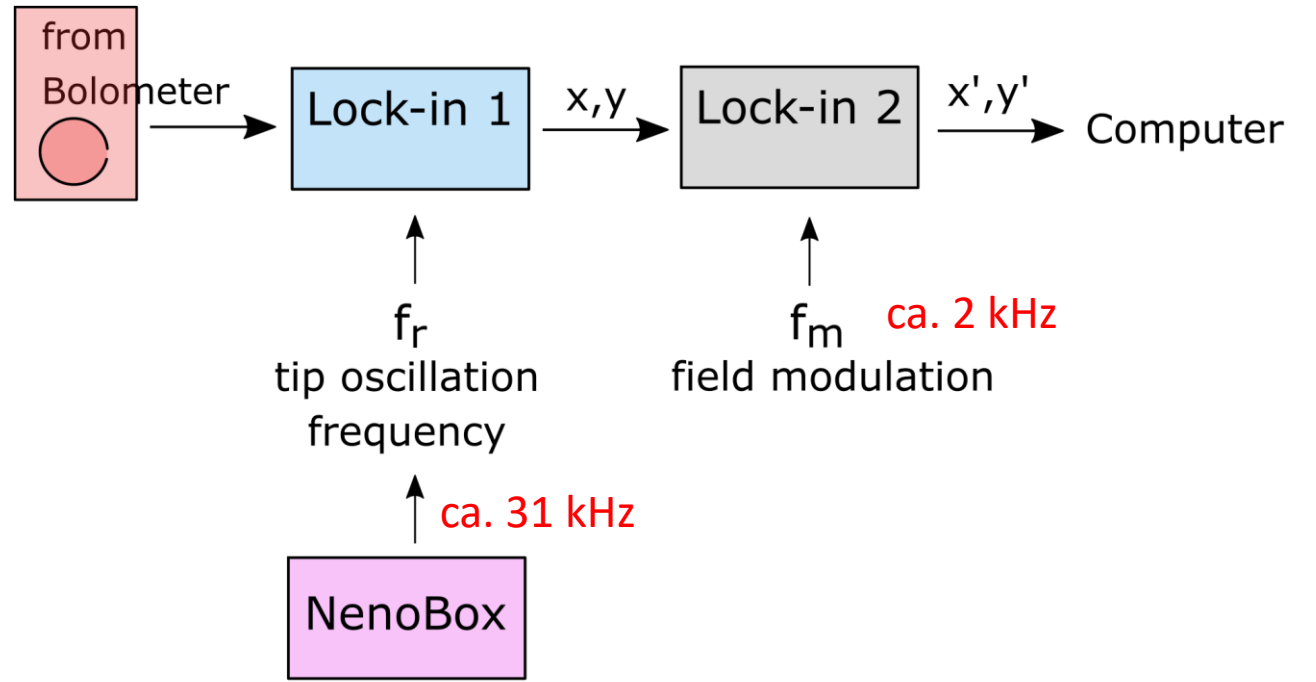
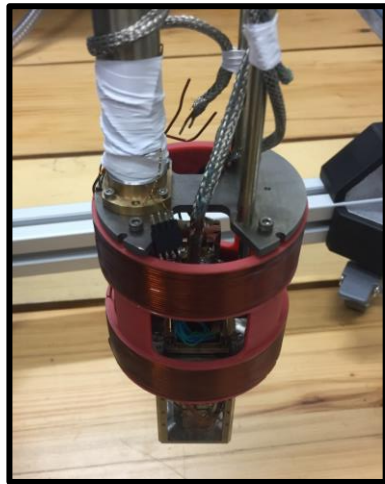
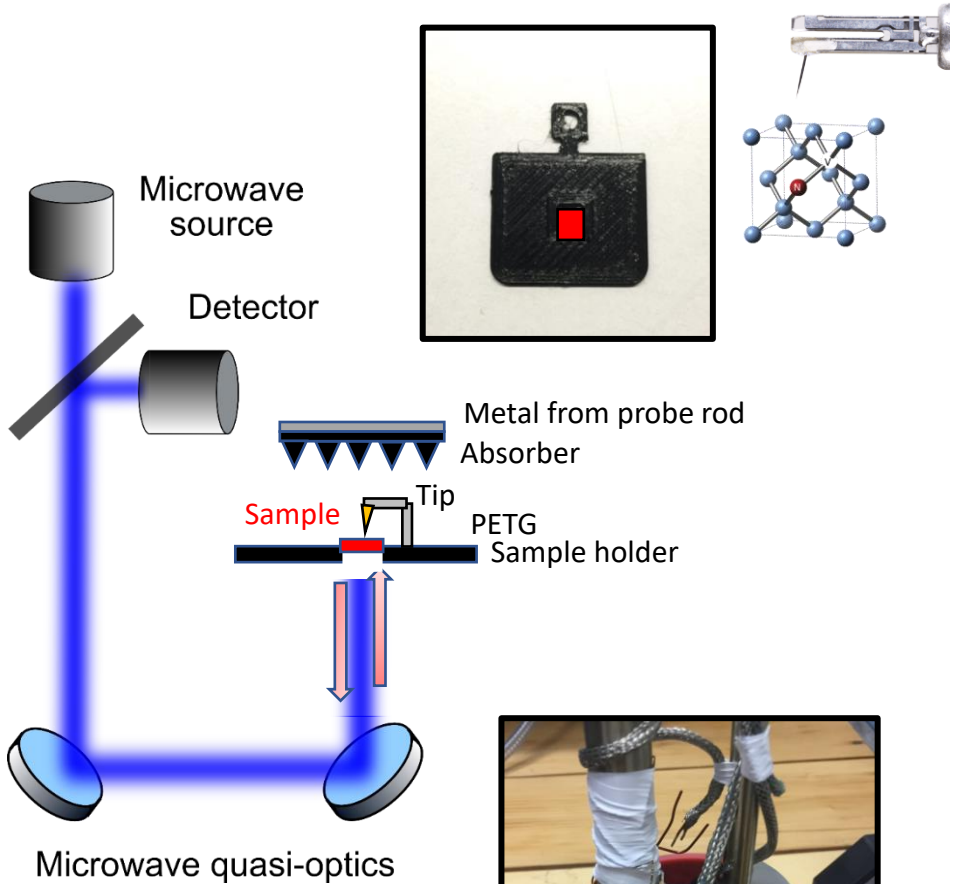
Center position of sample



zoom



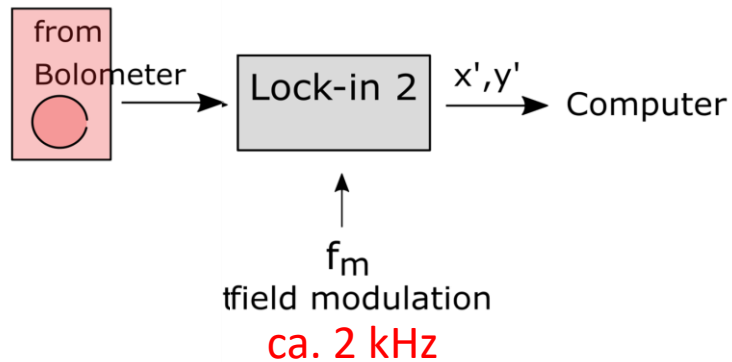
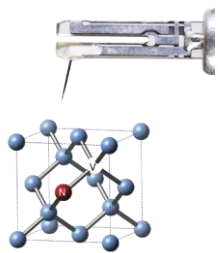
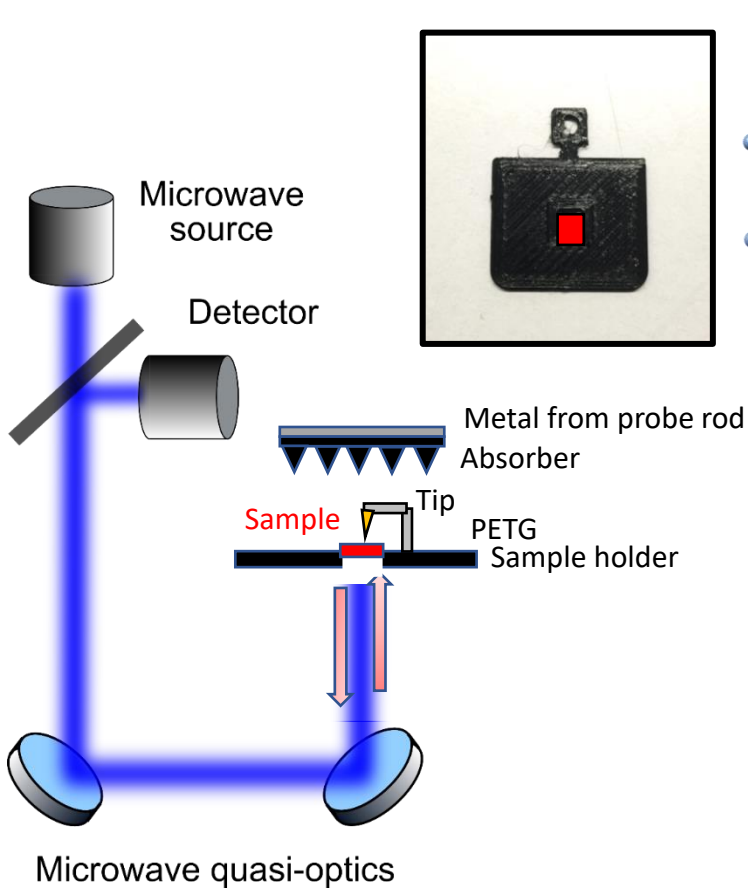
# EPR measurements with tip: double demodulation scheme



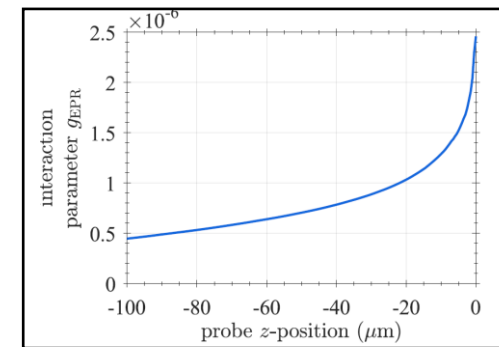
Problem with locking the external reference frequency from the Nenobox to LIA1 for certain frequencies and/or amplitudes of the field modulation. Solve it.

No signal found.

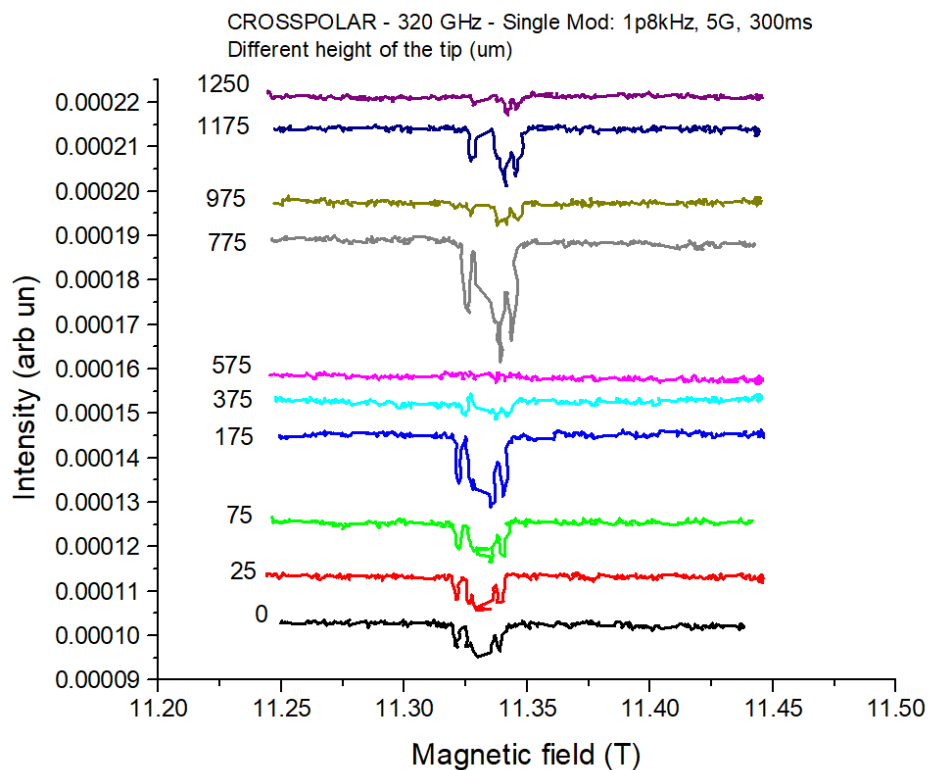
# EPR measurements with tip



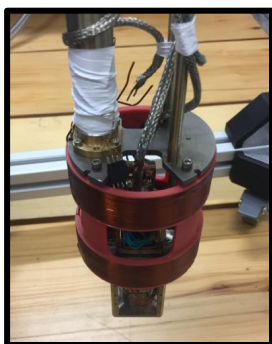
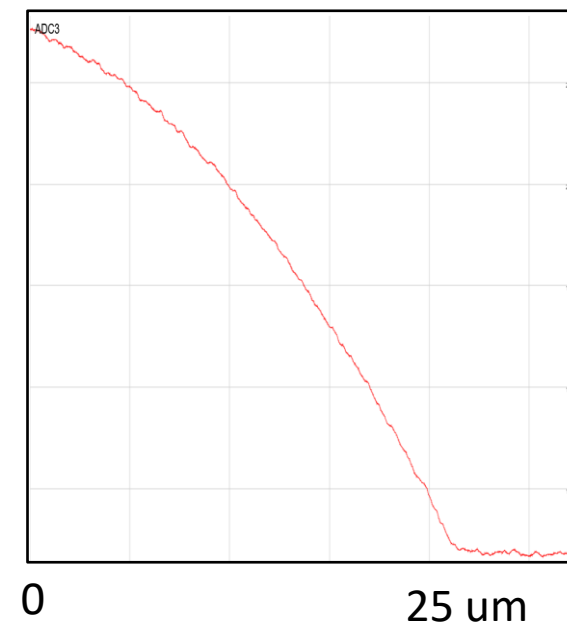
From Hrton's simulations



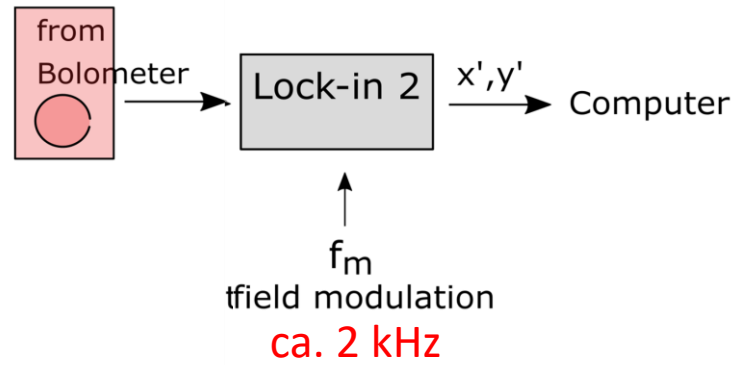
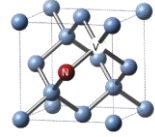
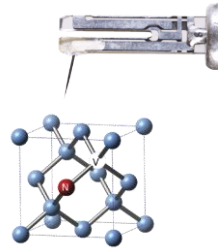
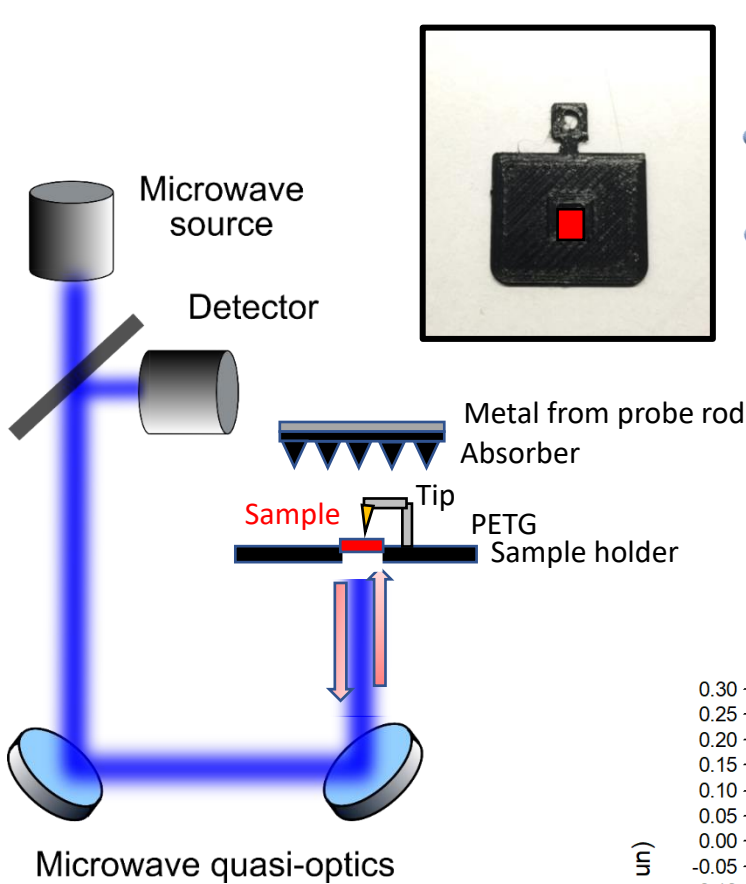
## Normal EPR (demodulated at field) with tip approach and at different height



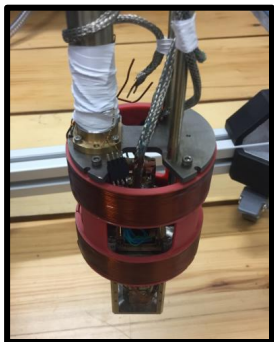
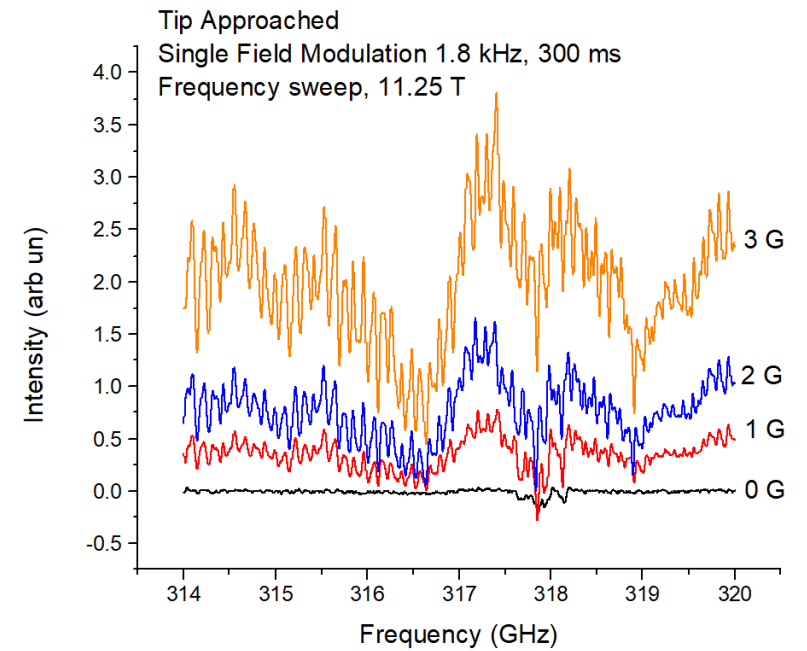
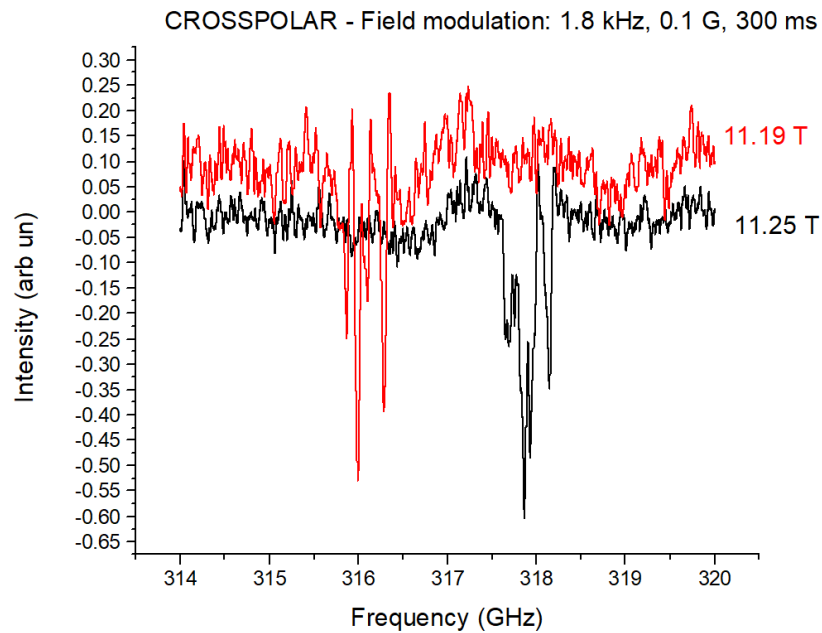
Sample resonant position and continuous sweep of tip distance



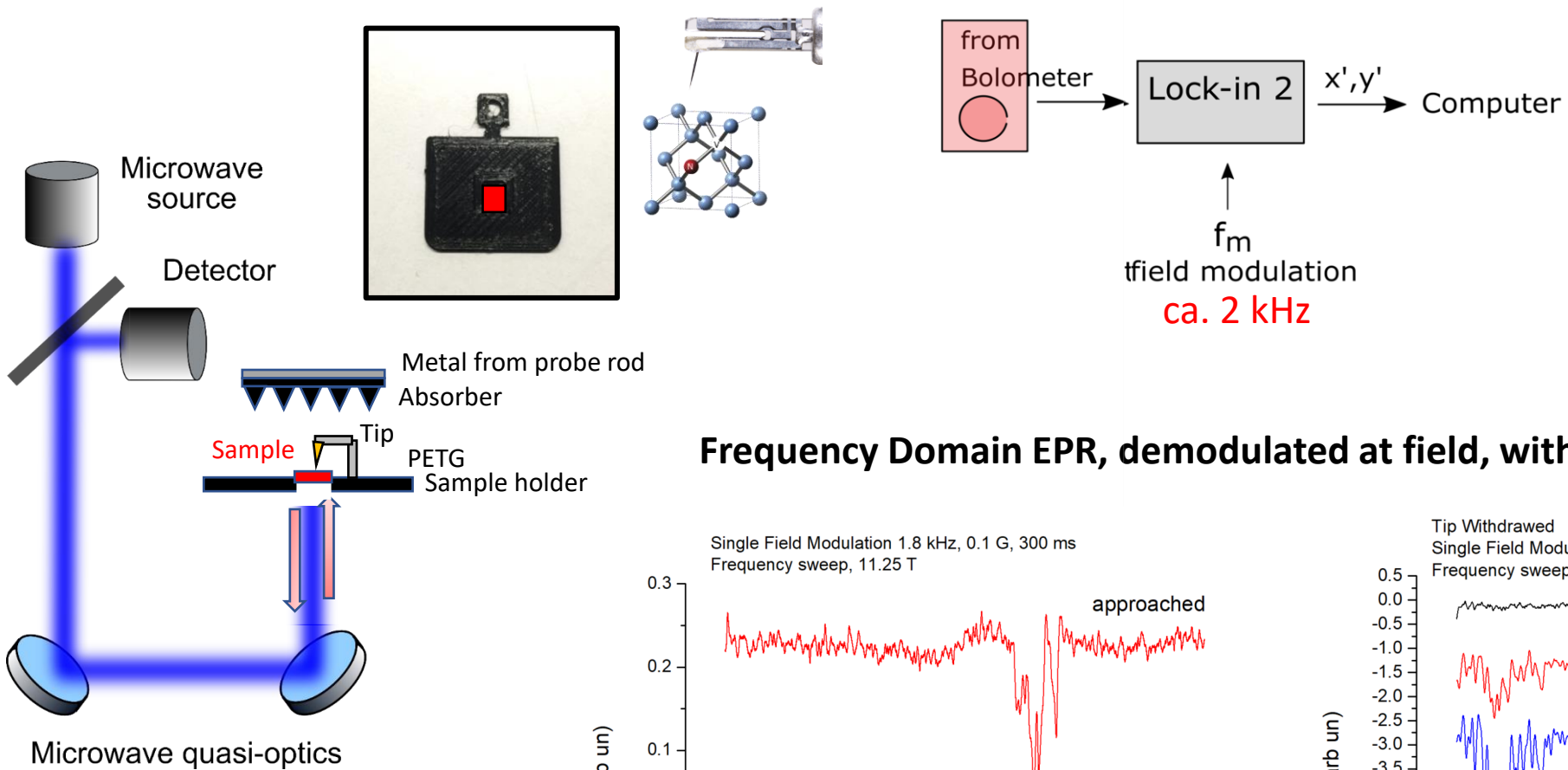
# EPR measurements with tip



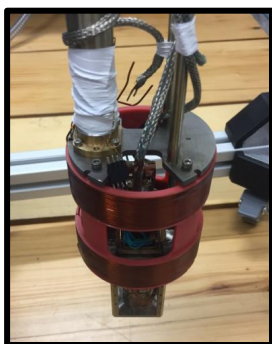
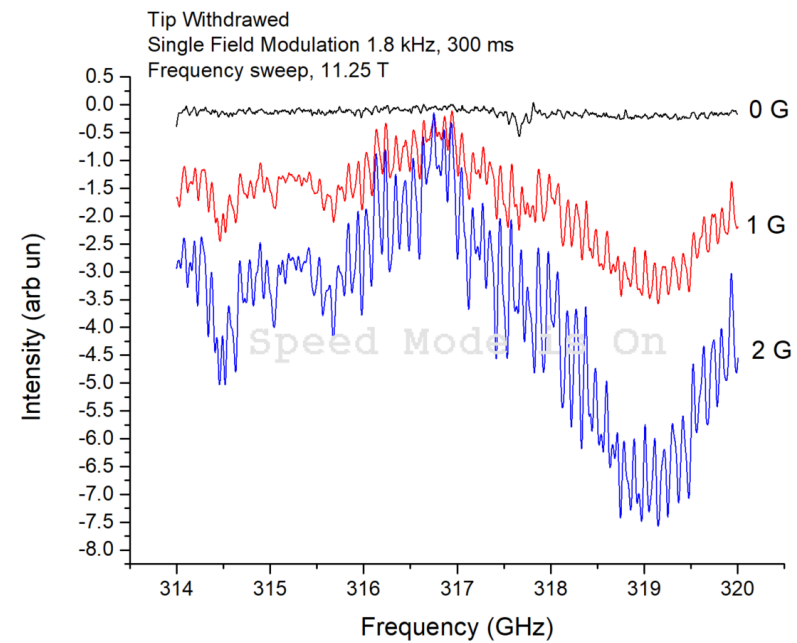
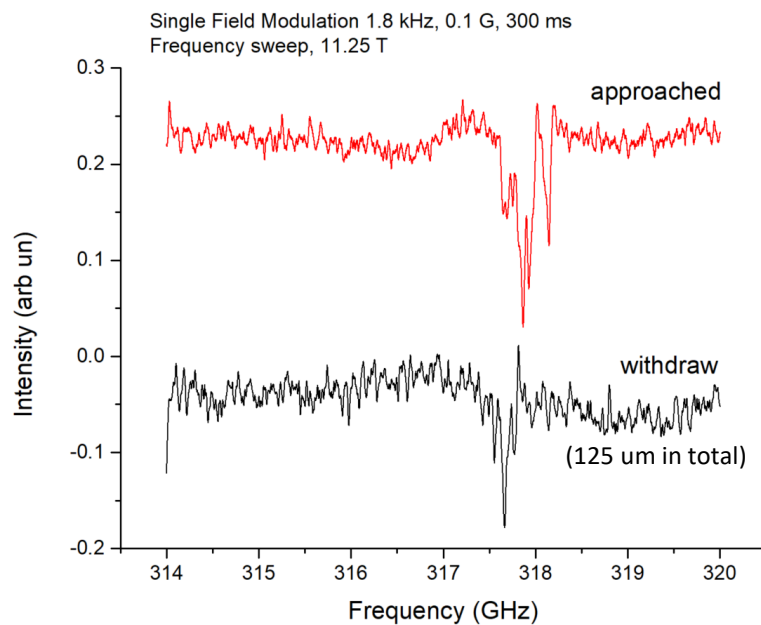
## Frequency Domain EPR, demodulated at field, with tip approached



# EPR measurements with tip

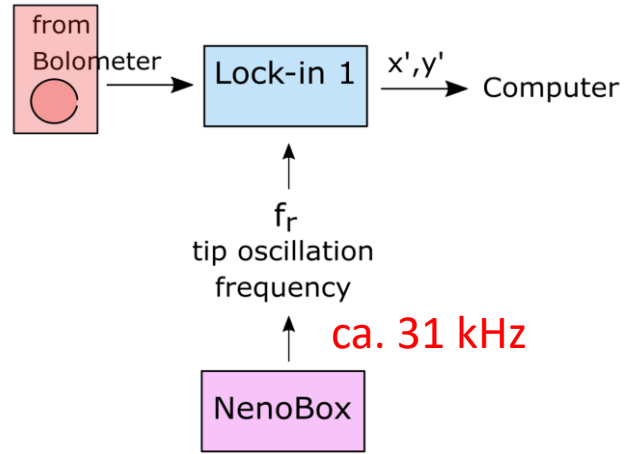
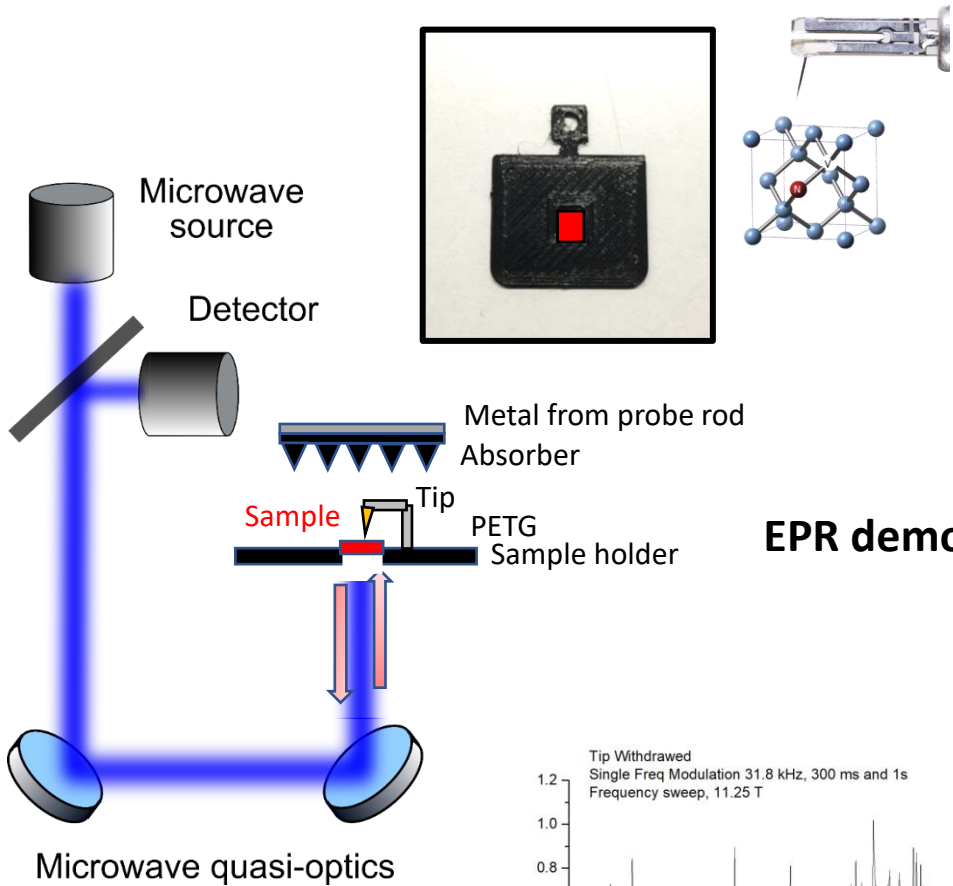


## Frequency Domain EPR, demodulated at field, with tip approach and withdraw

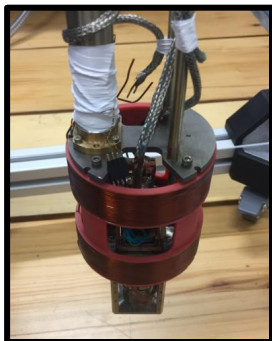
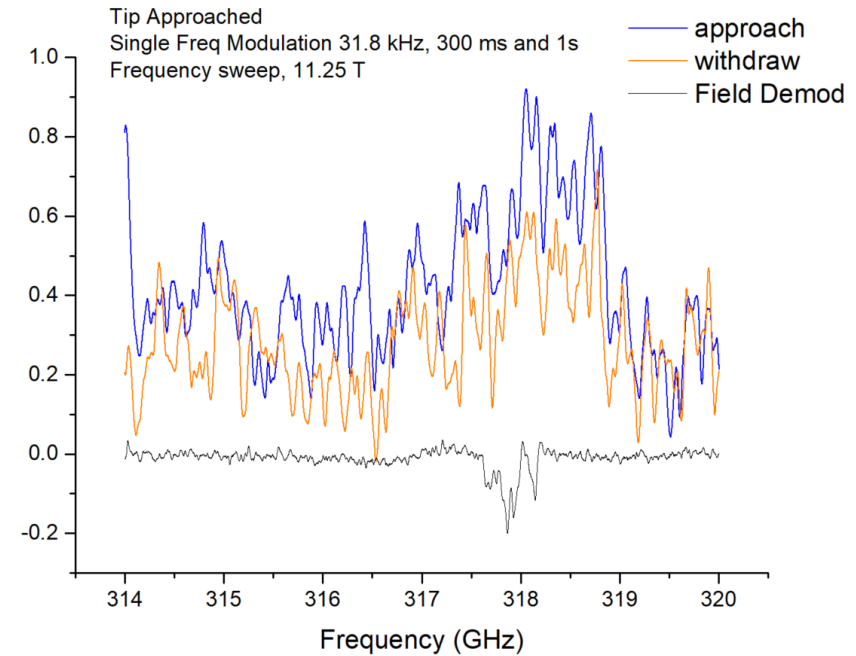
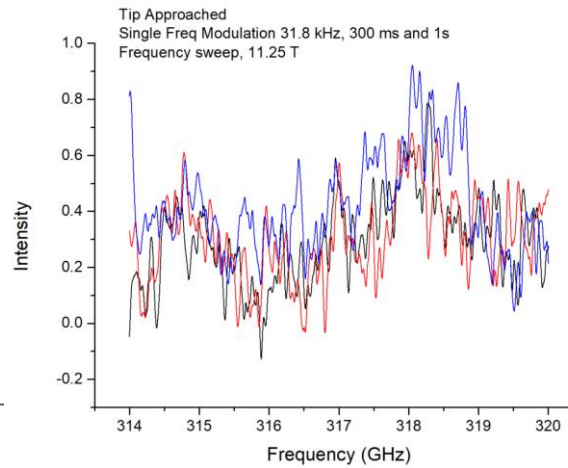
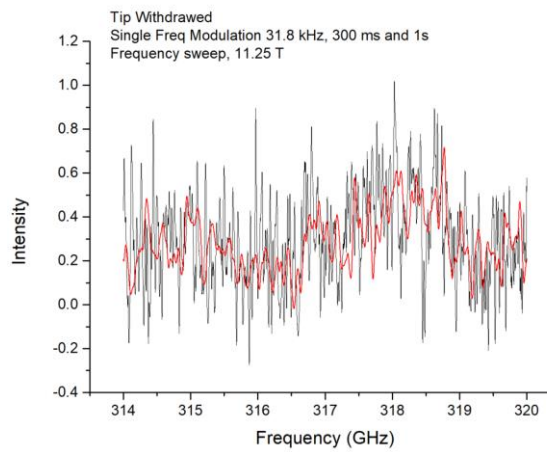




# EPR measurements with tip



## EPR demodulated at frequency tip oscillation with tip approach and at different height



## Conclusions

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- NV diamond is bulk sample, therefore the enhanced signal might be lost in strong background;
- NiFe disks were not tested yet with the tip. NiFe uniform layer could be a better choice for starting;
- We have just started to investigate the presence of a signal using the various possibilities of demodulation and more time is needed;
- We still miss the experimental observation of the response from a single tip.

**Thank you all for your efforts!**