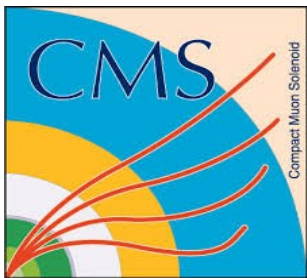


Current over Time measurements and **IV** characterisation of **BCM1F** sc irradiated diamonds

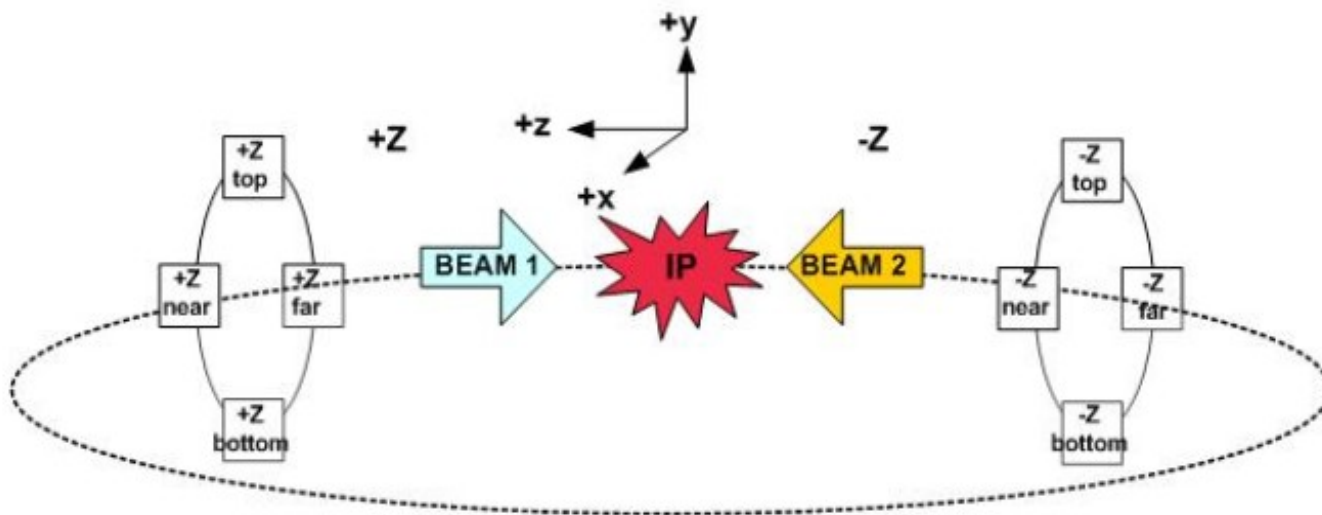


Olena Karacheban
CMS group meeting
16 Sep 2013

List of diamonds

Accordance to installation place can be found on wiki page:
<https://wiki-zeuthen.desy.de/CMS/BCM1FDiamonds#preview>

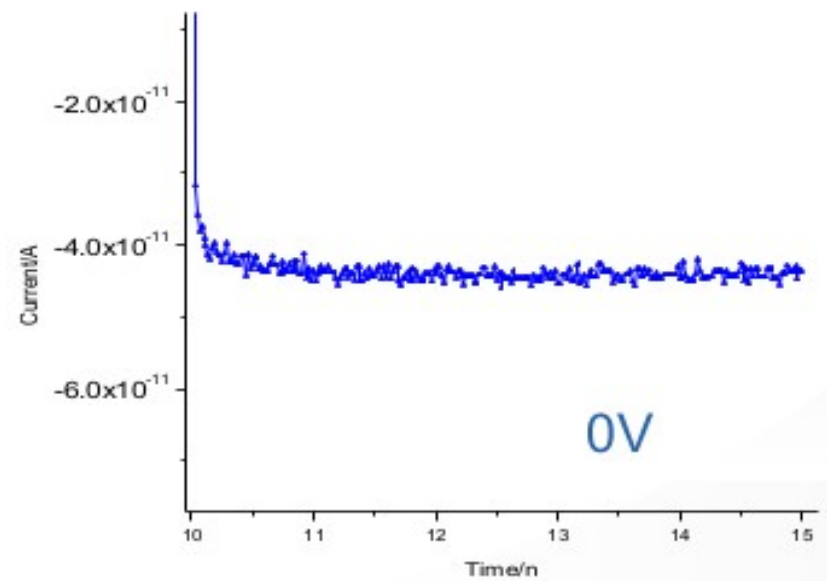
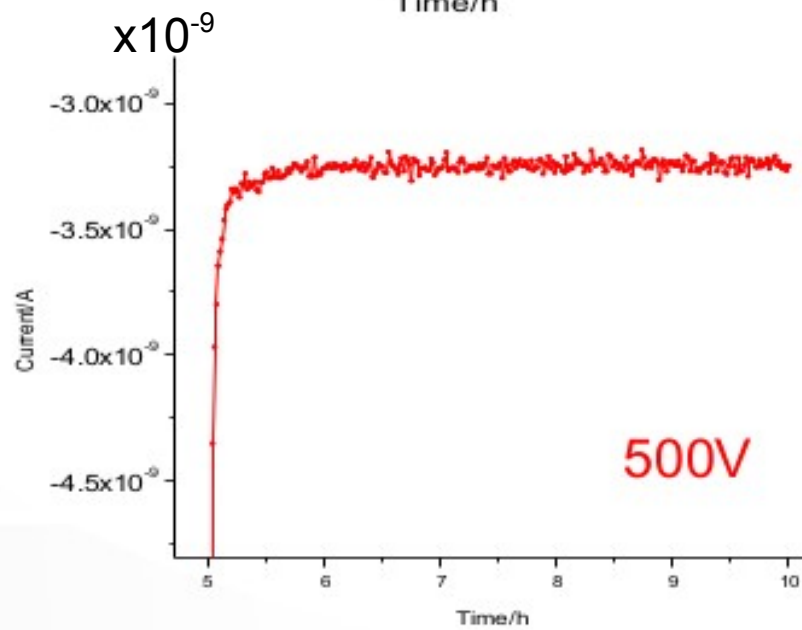
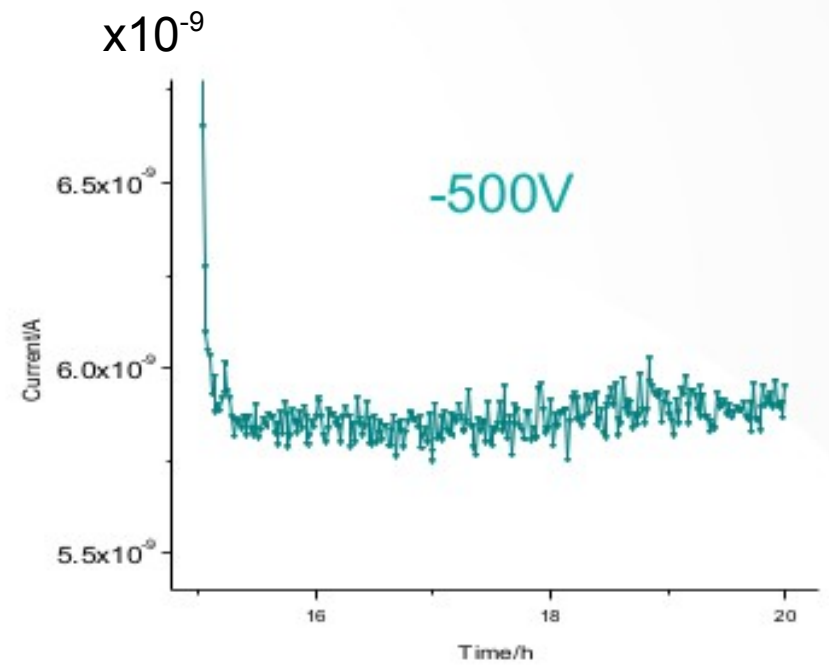
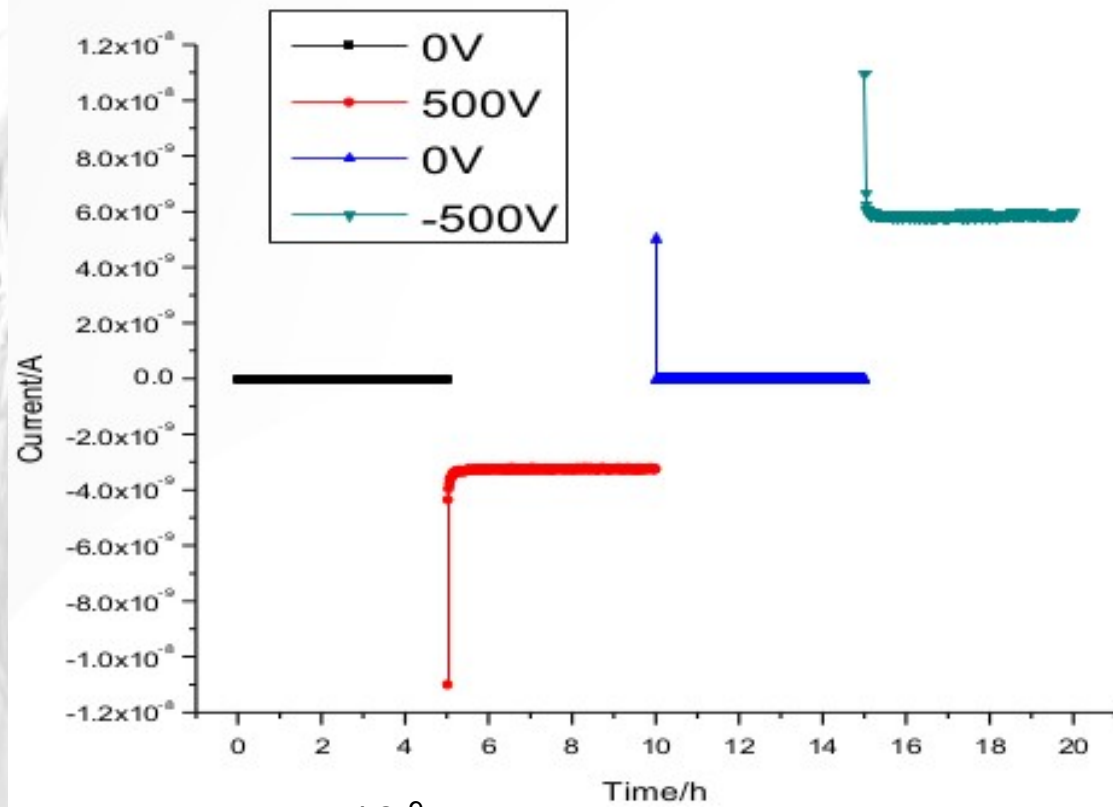
- + Z Top
- + Z Bottom
- + Z Far
- + Z Near
- - Z Top
- - Z Bottom
- - Z Far
- - Z Near



All diamond were put in the frames for measurements.

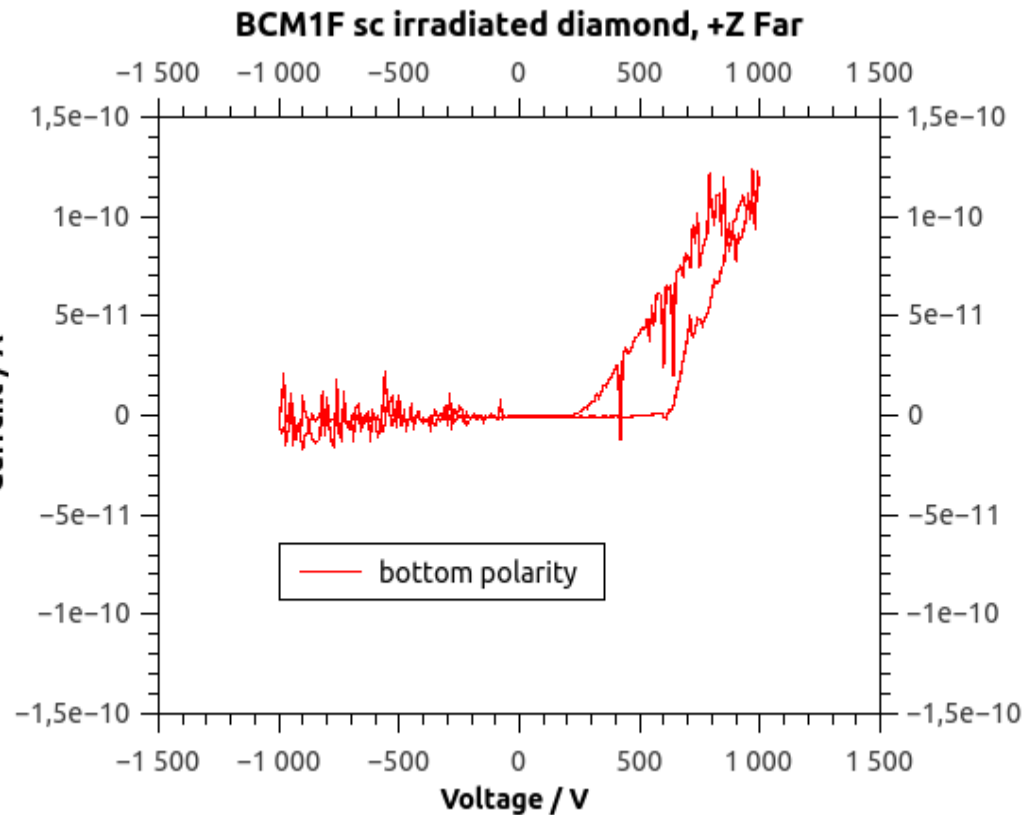
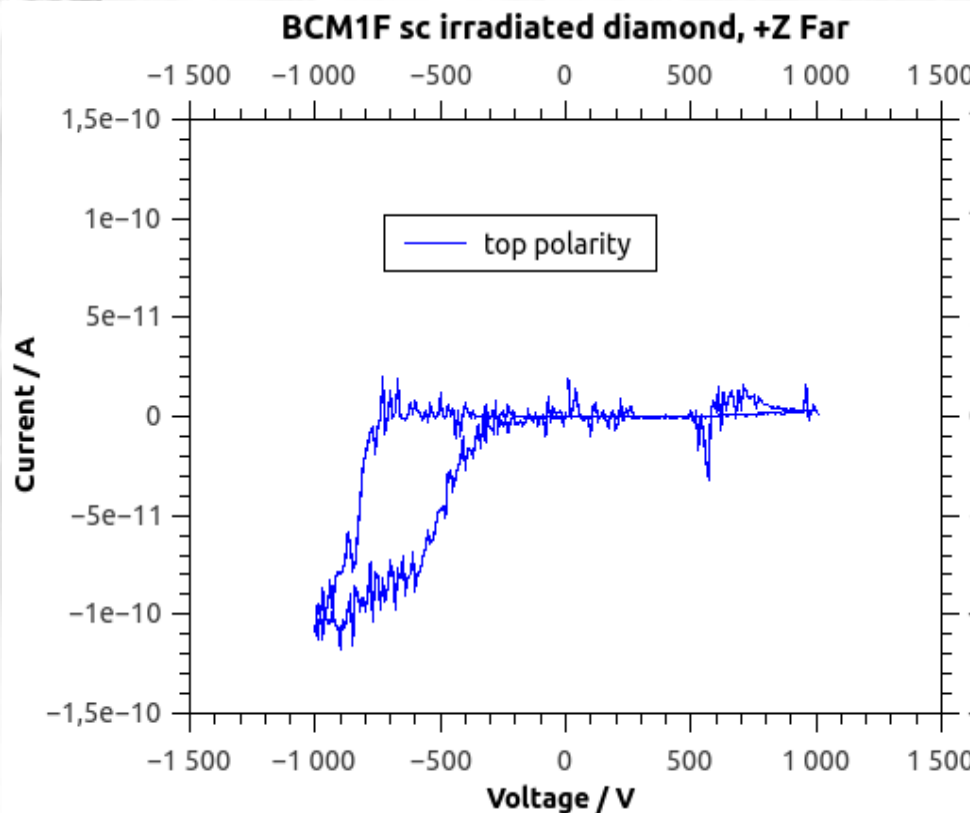


* **+Z Far**



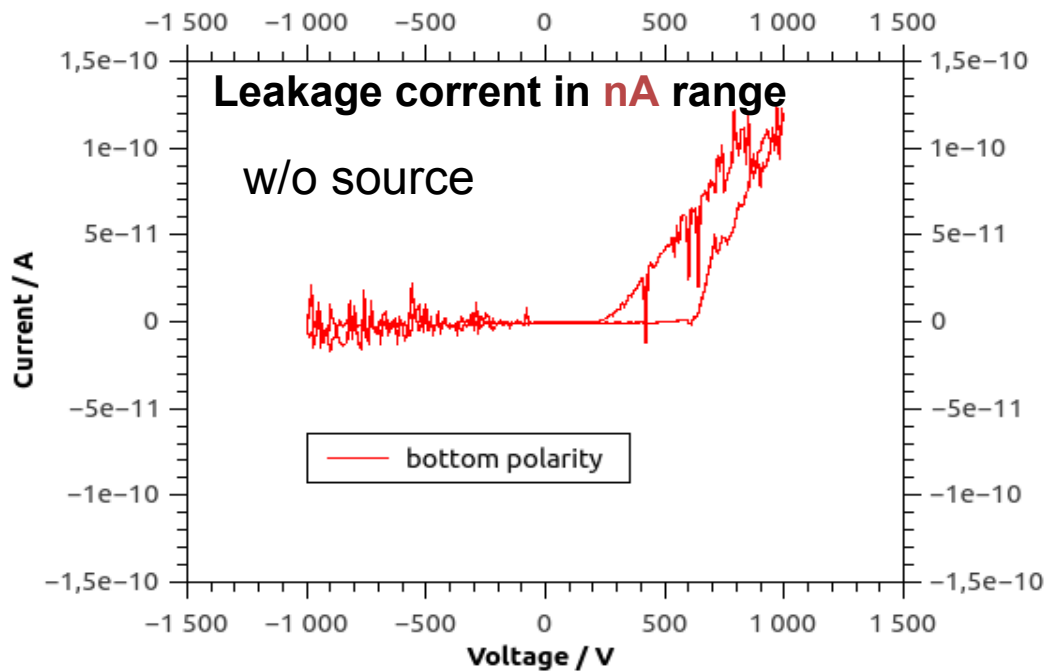
IV characterisation +Z Far diamond

current for measurements with source for -500V is $6 \times 10^{-9} \text{A}$, for 500V it is $-3.5 \times 10^{-9} \text{A}$. → for measurement w/o source it should be less.

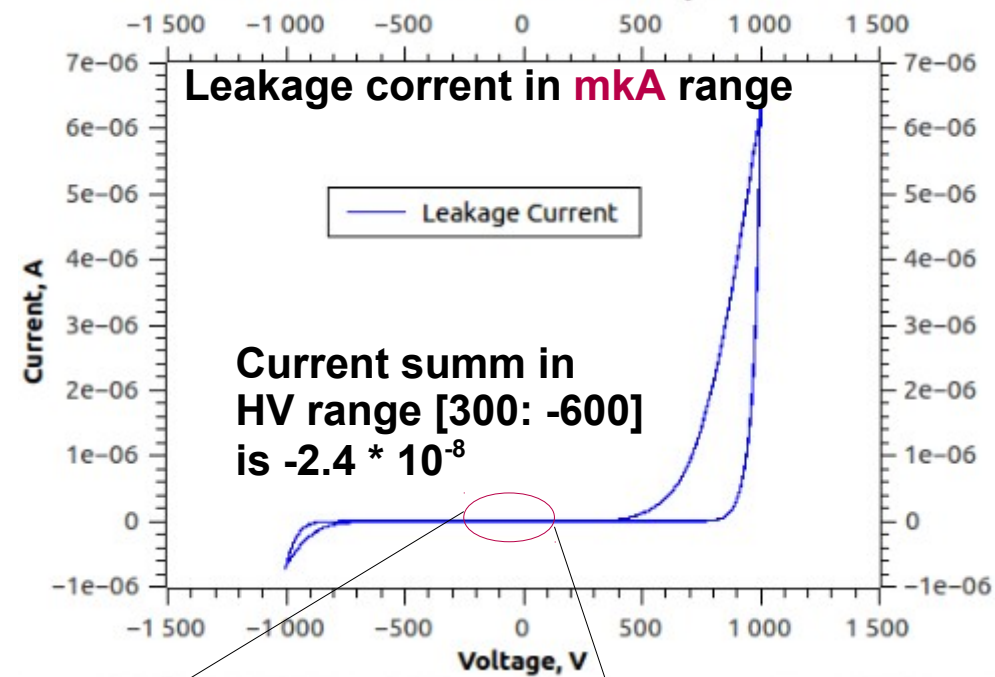


Comparison of leakage current for **irradiated** and **fresh** diamonds

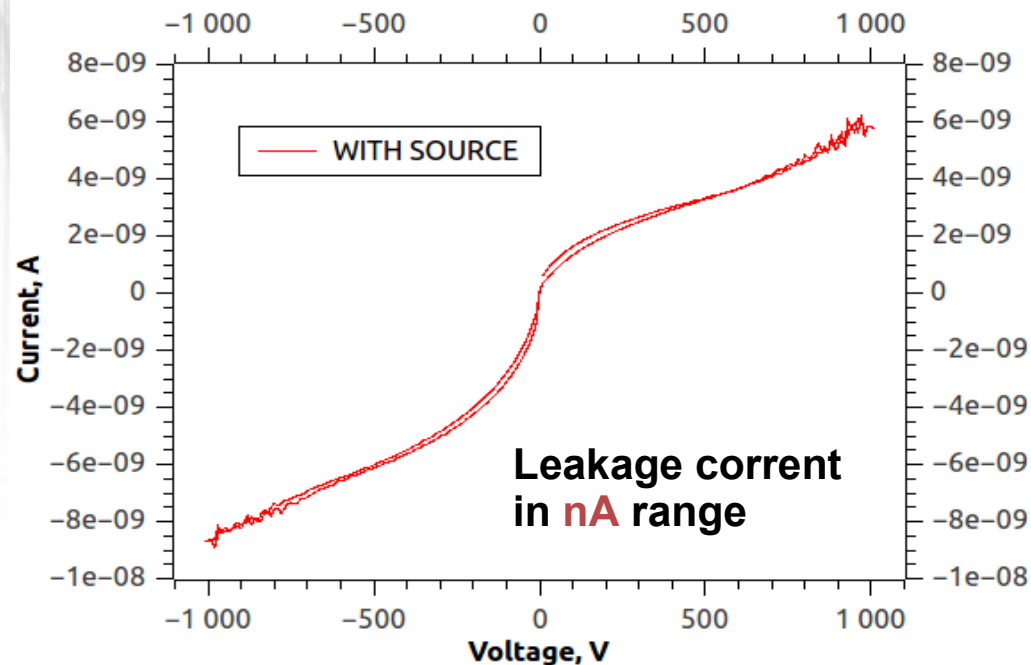
BCM1F sc irradiated diamond, +Z Far



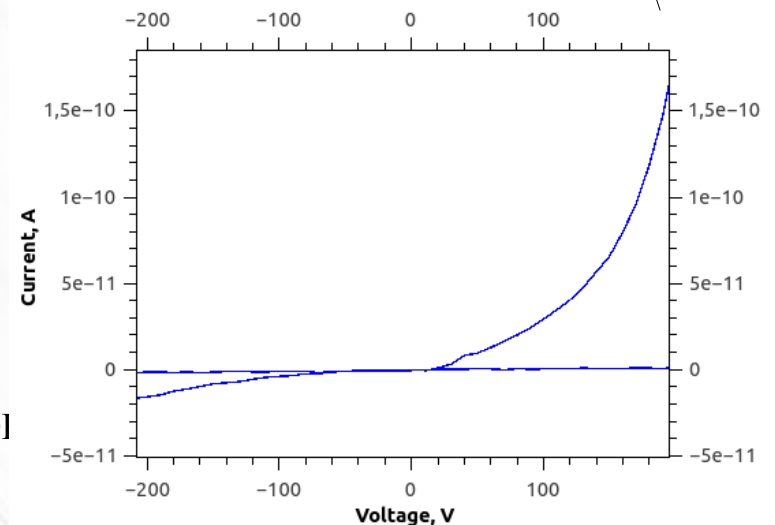
IV for new diamond 23851342 w/o source



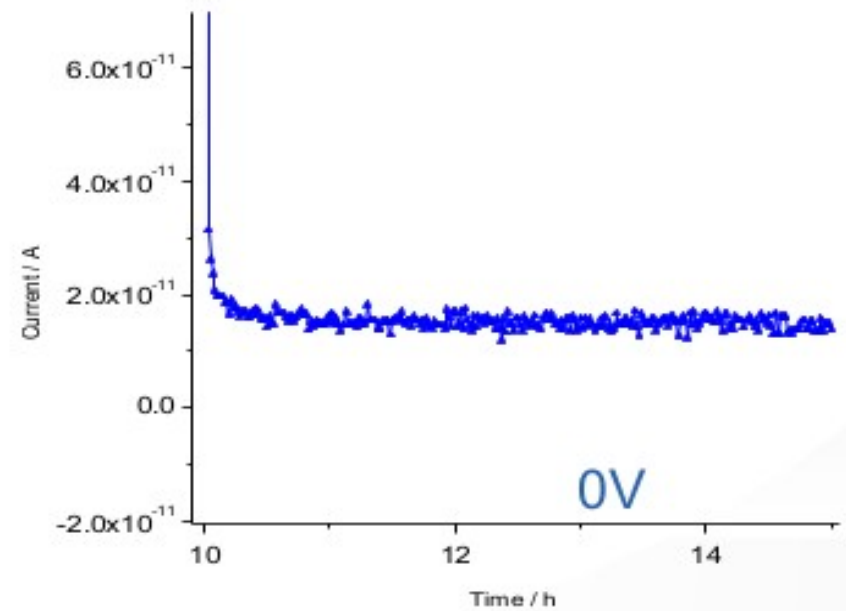
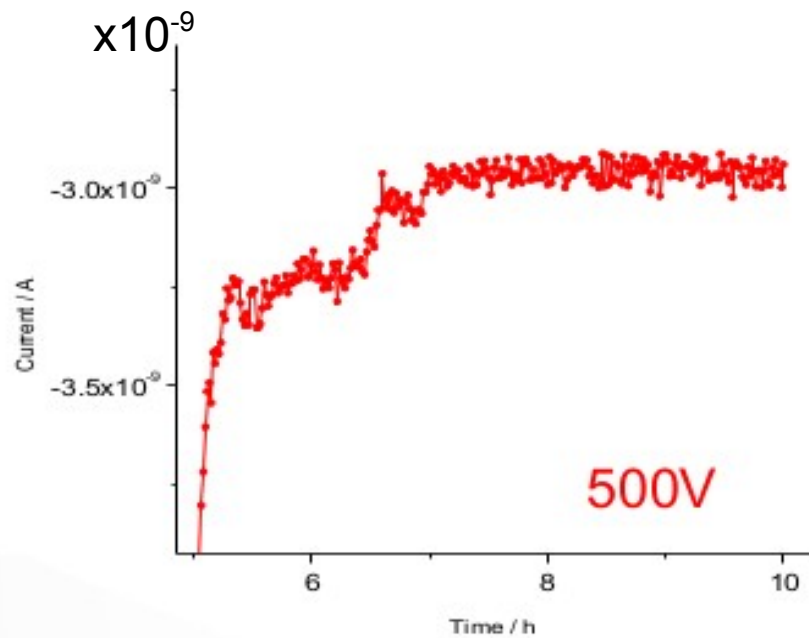
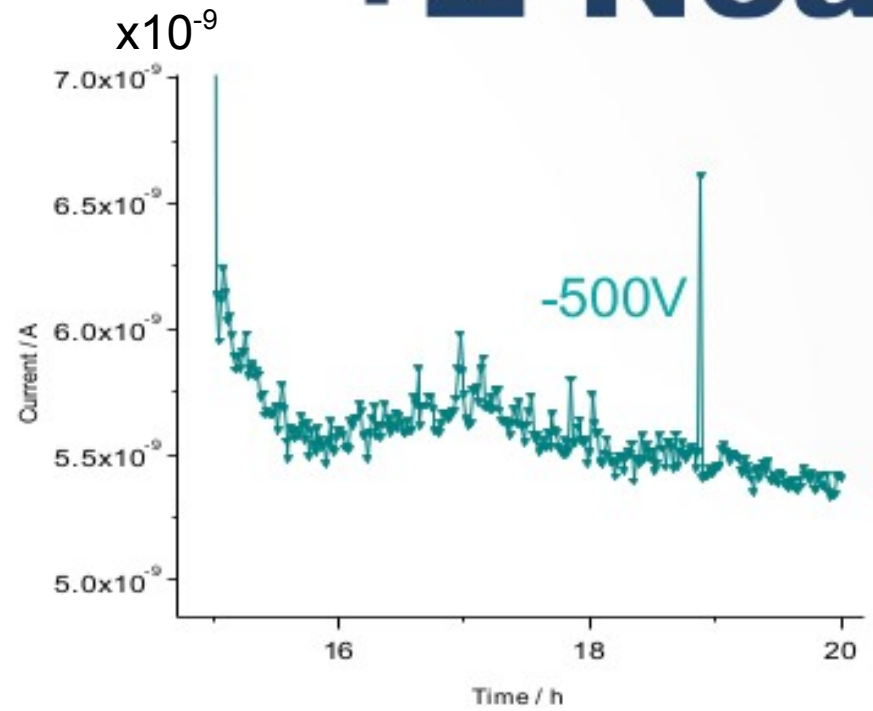
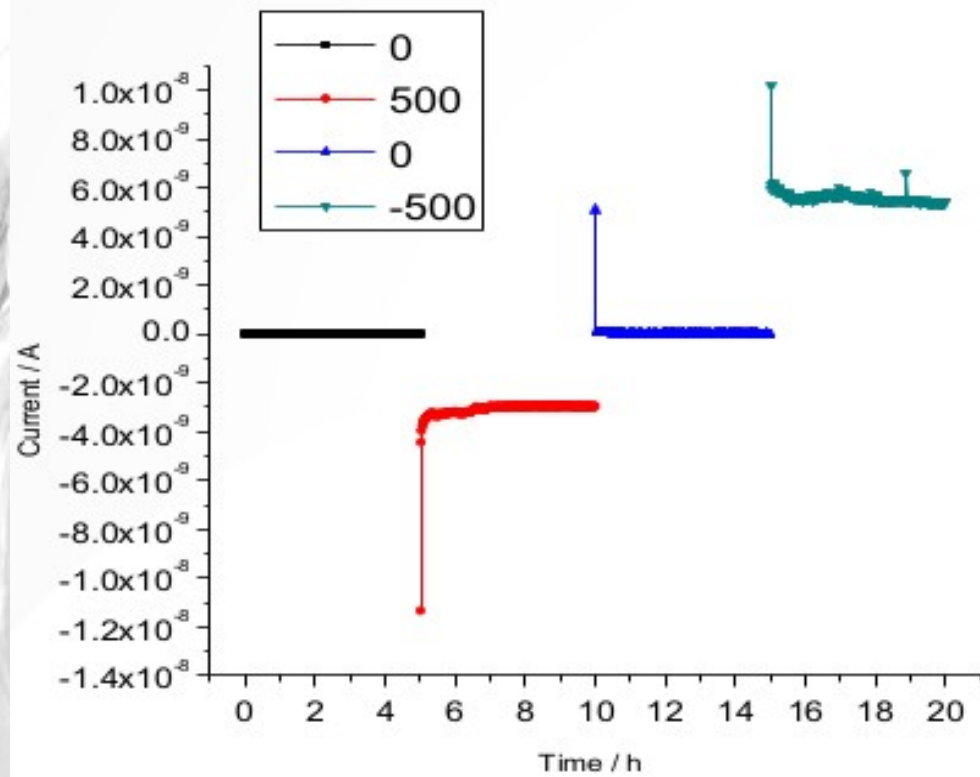
IV curve, BCM1F irradiated diamond, +Z Far, Bottom polarity



IV for new diamond 23851342 w/o source

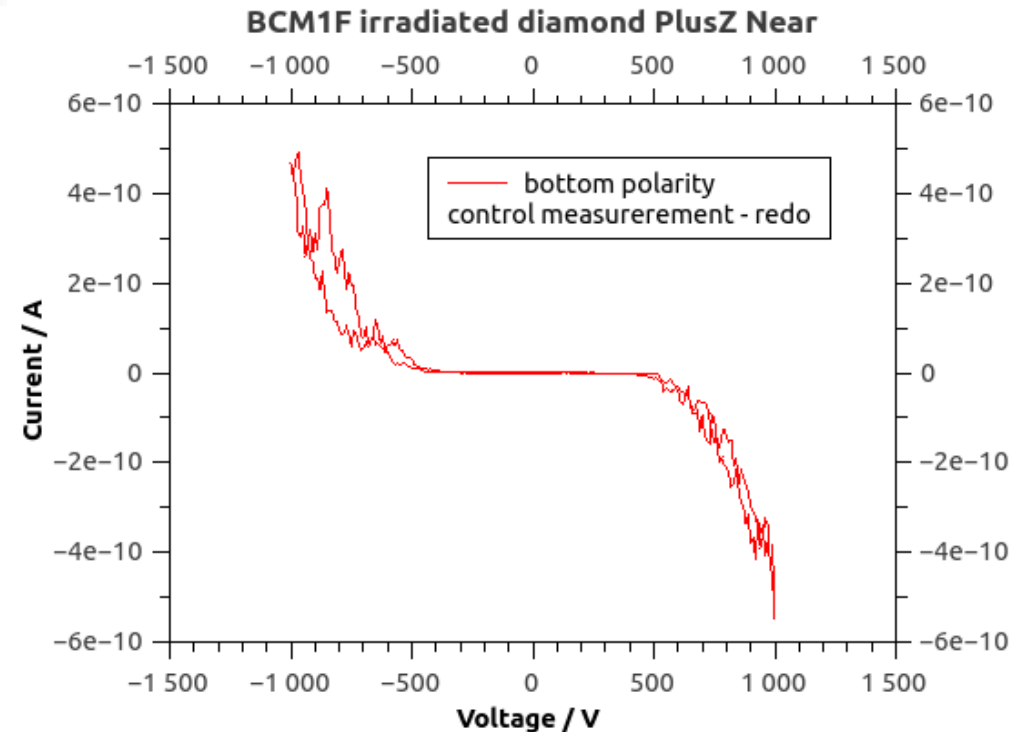
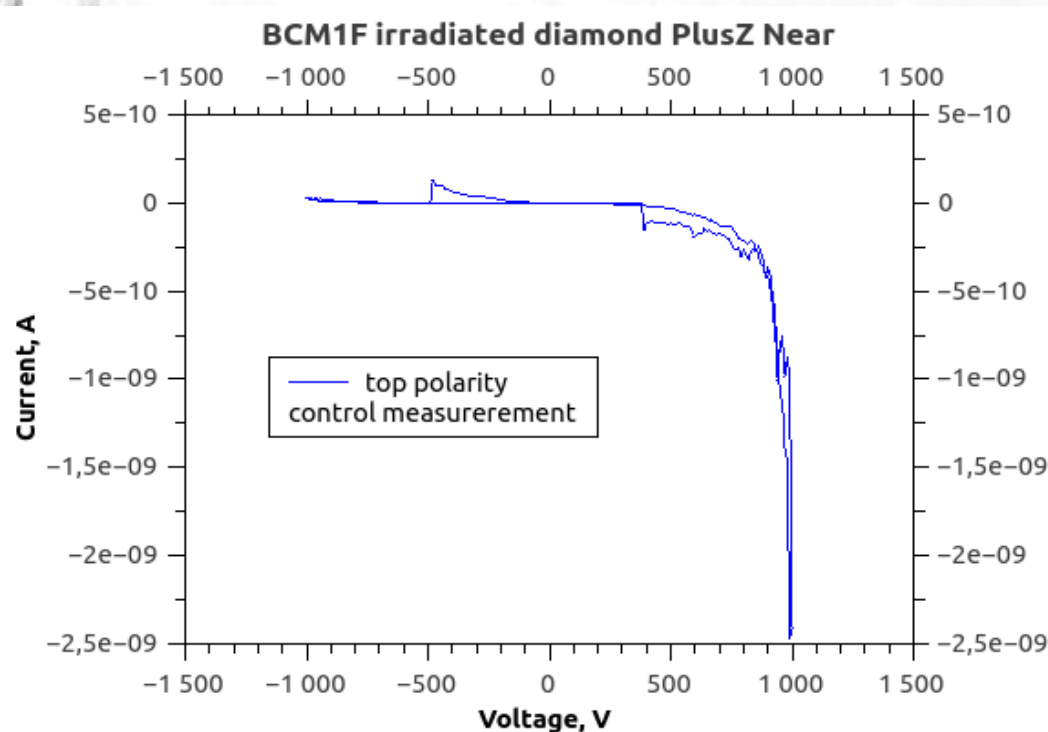


* **+Z Near**



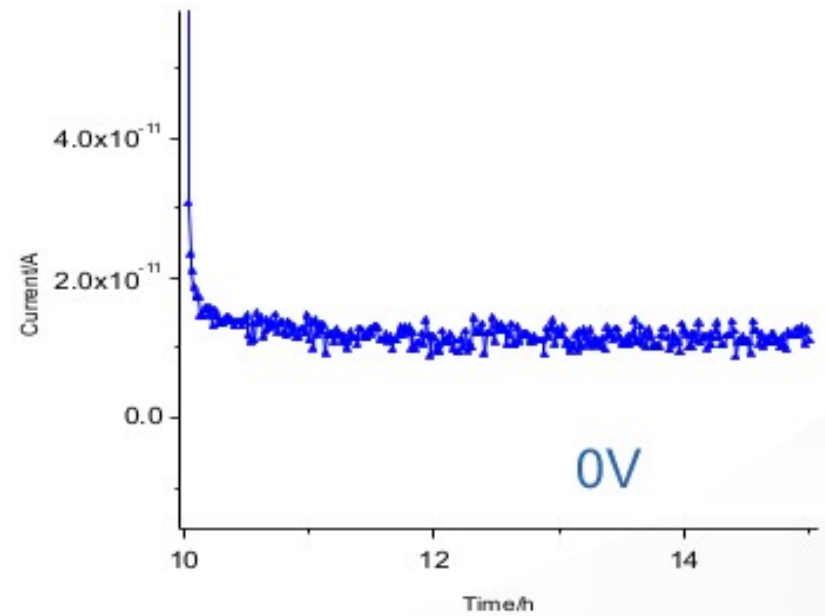
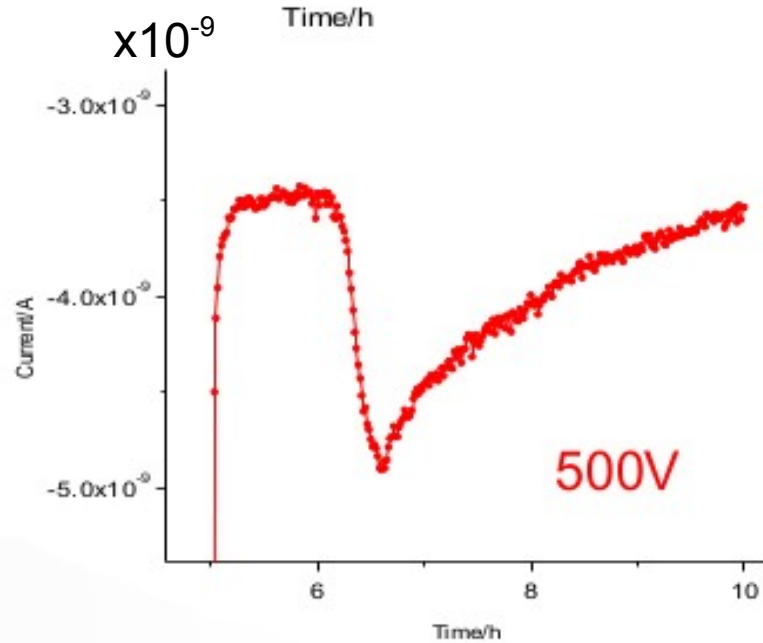
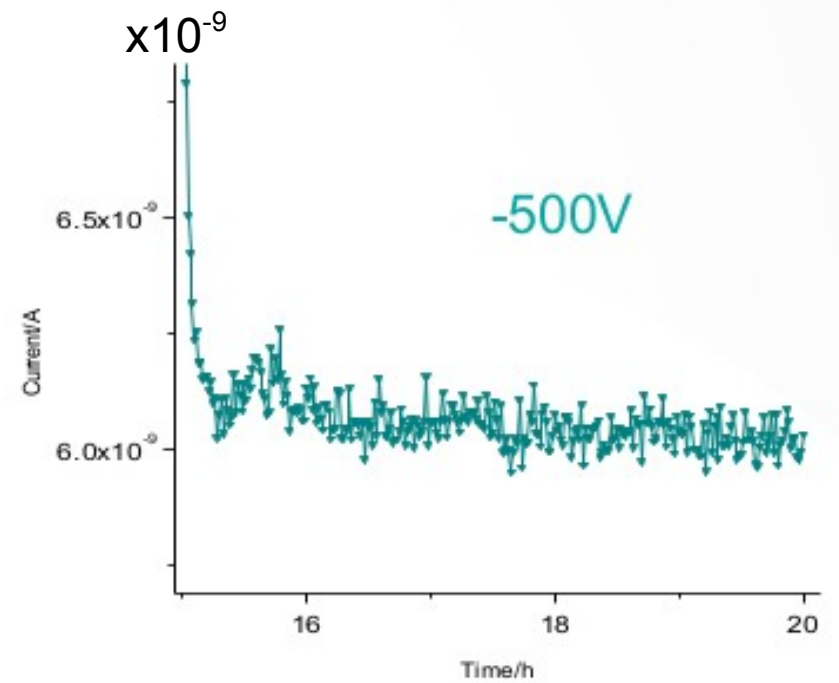
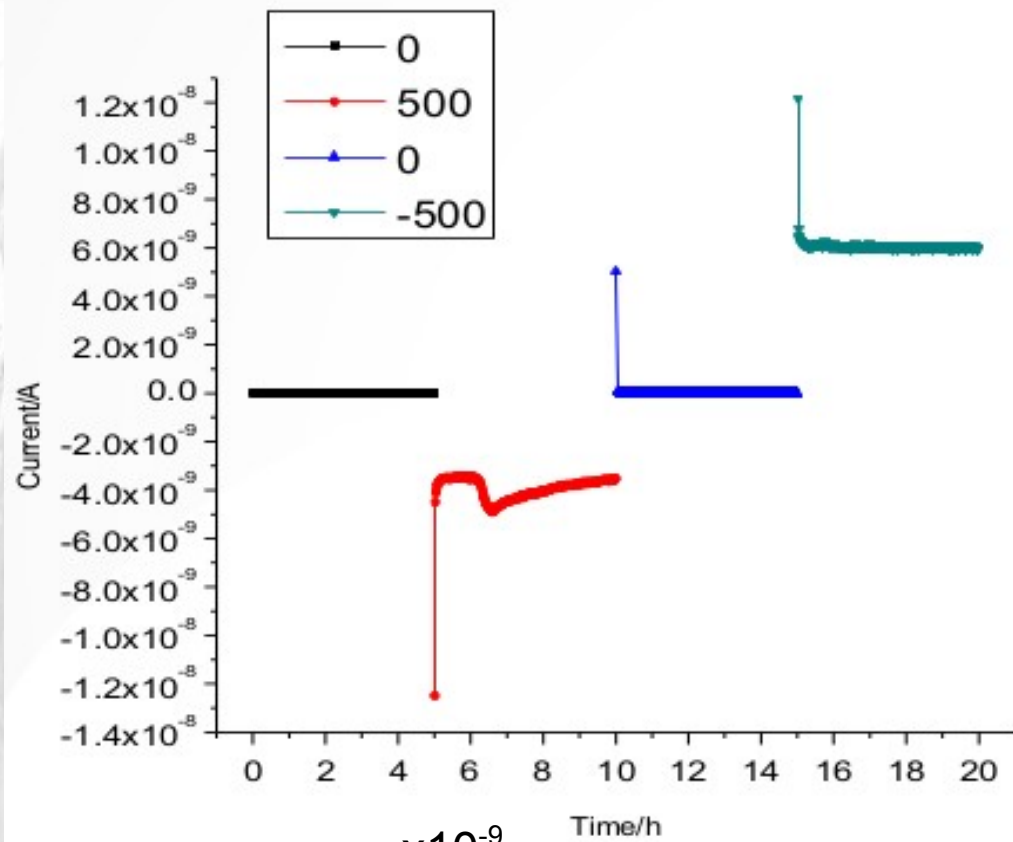
IV characterisation +Z Near diamond

current for measurements with source for -500V is 5.5×10^{-9} A,
for 500V it is -3×10^{-9} A.



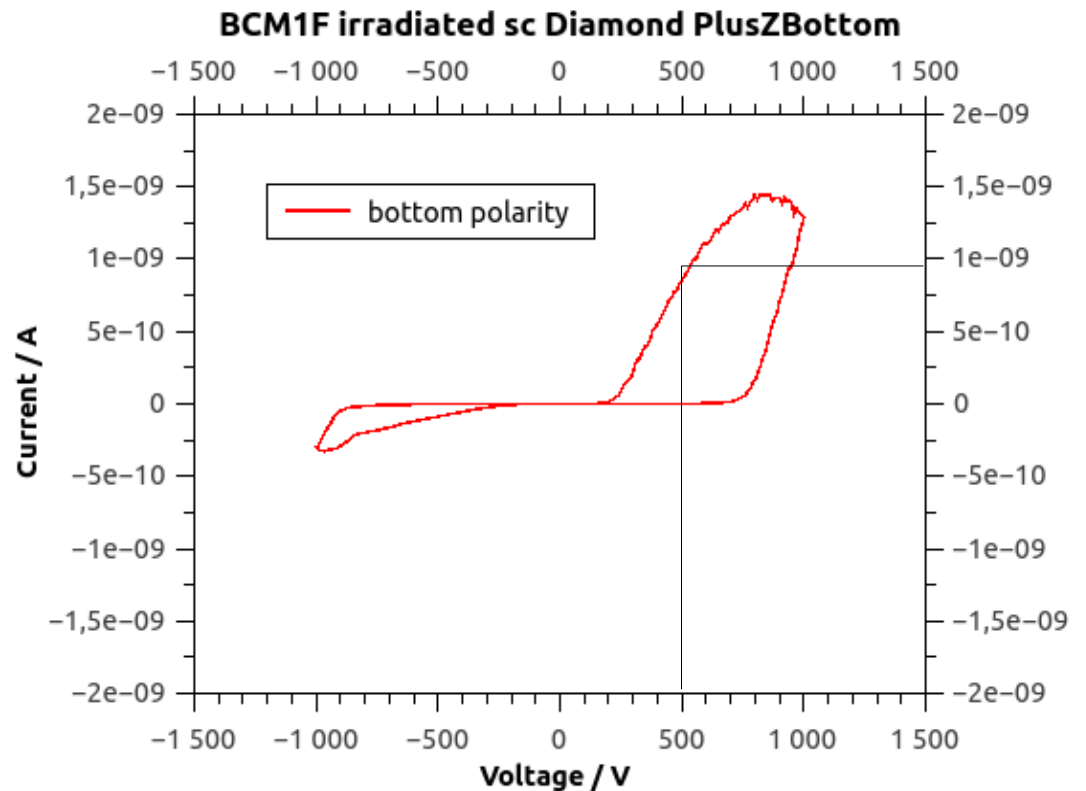
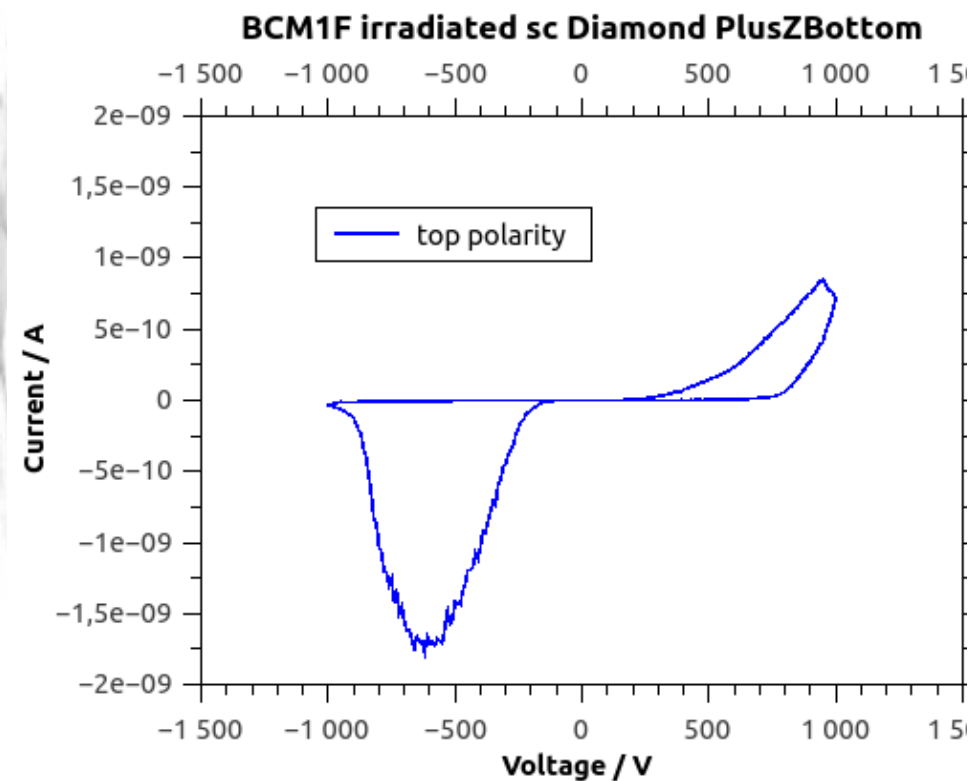
isolation of soldered part of wire was not good.

* +Z Bottom

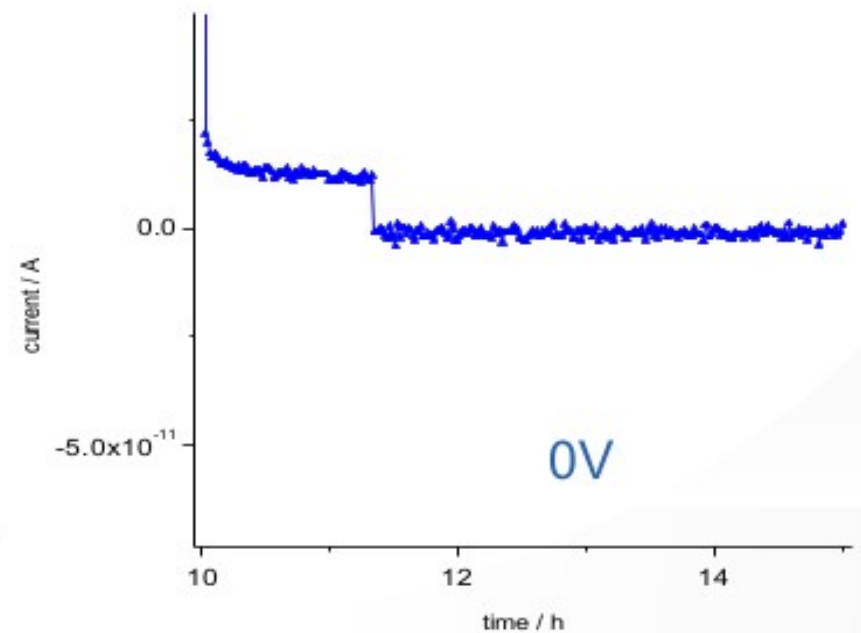
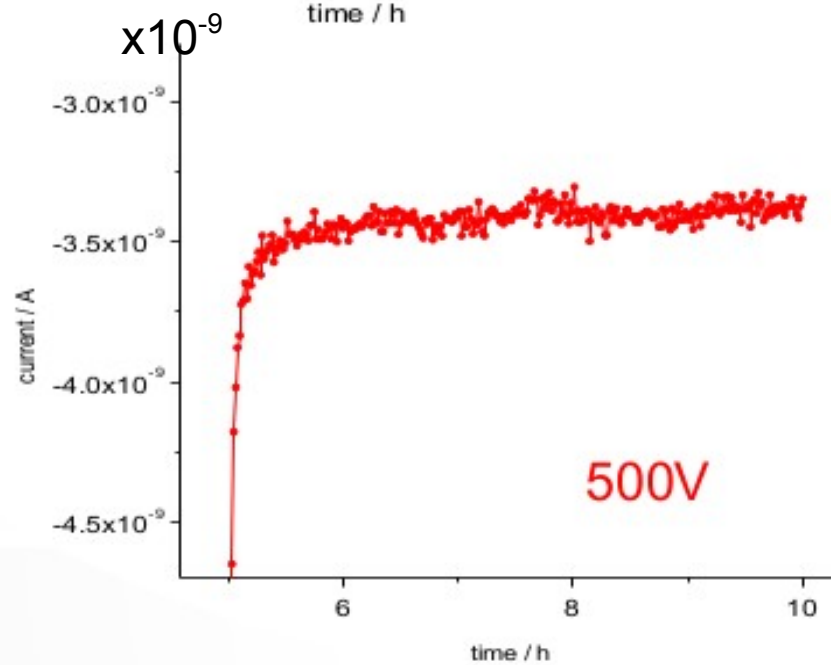
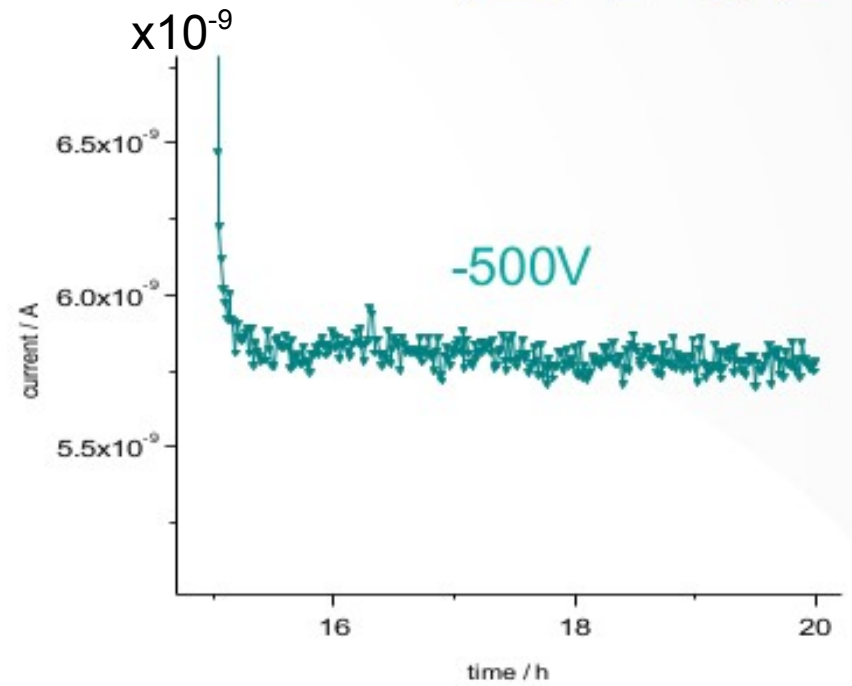
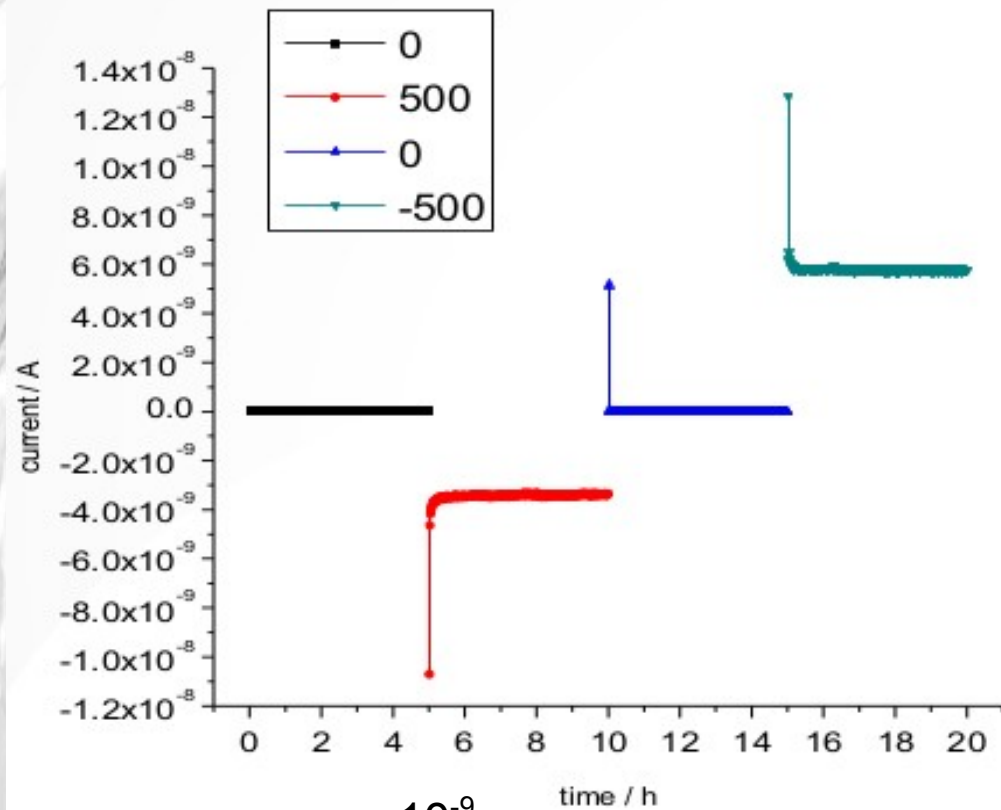


IV characterisation **+Z Bottom** diamond

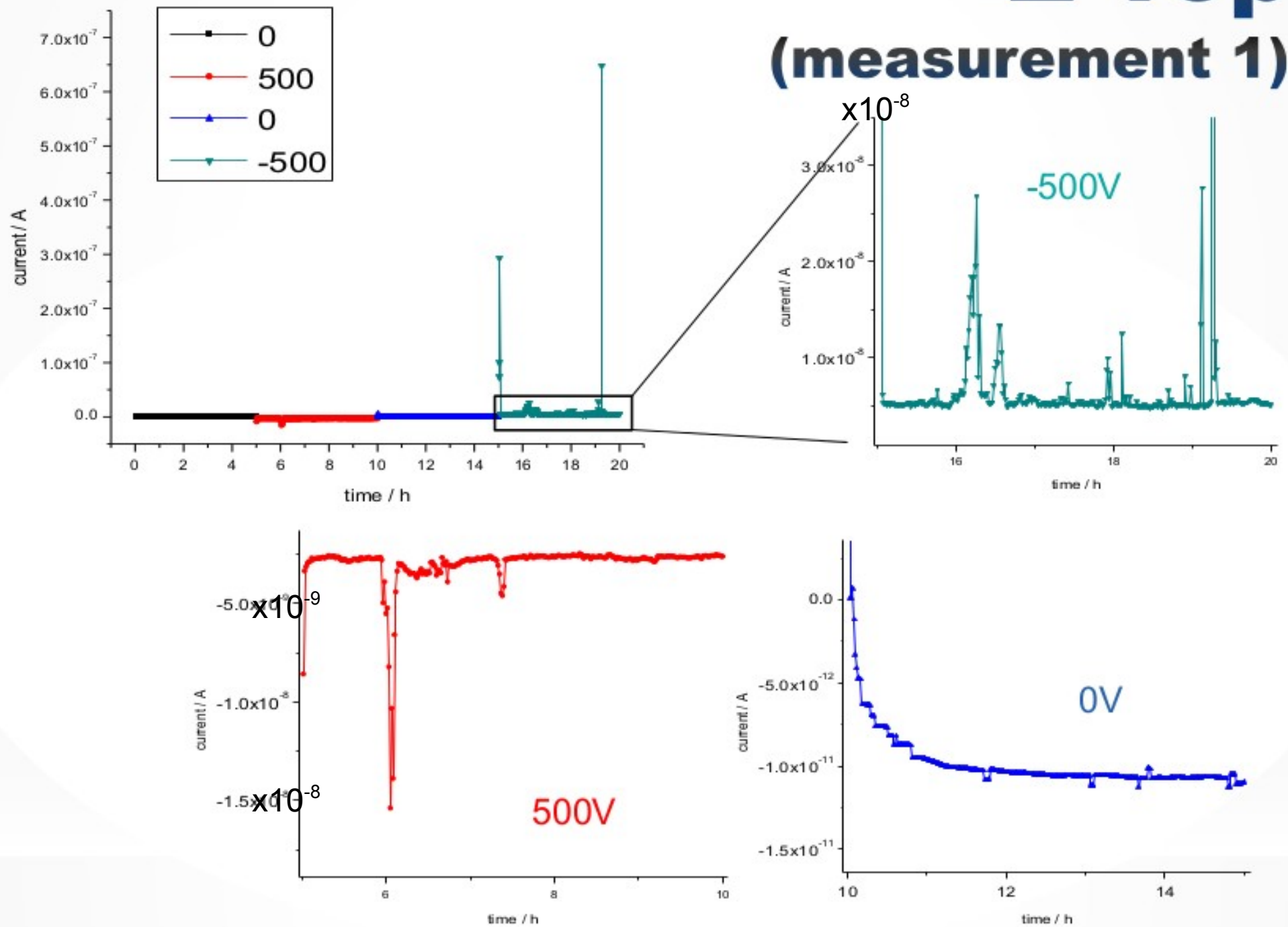
current for measurements with source for -500V is $6 \times 10^{-9} \text{ A}$,
for 500V it is $-3.5\text{-}5 \times 10^{-9} \text{ A}$.



*-Z Far

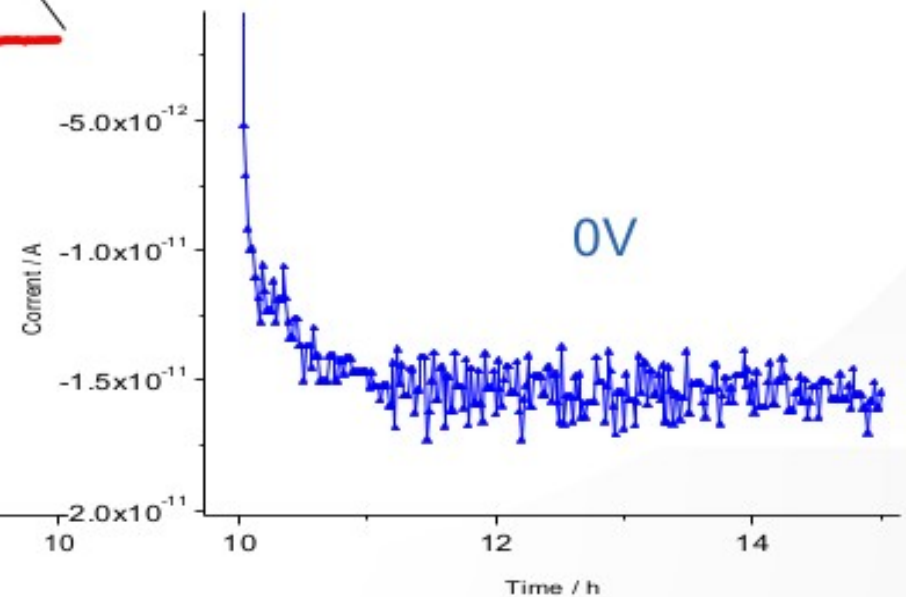
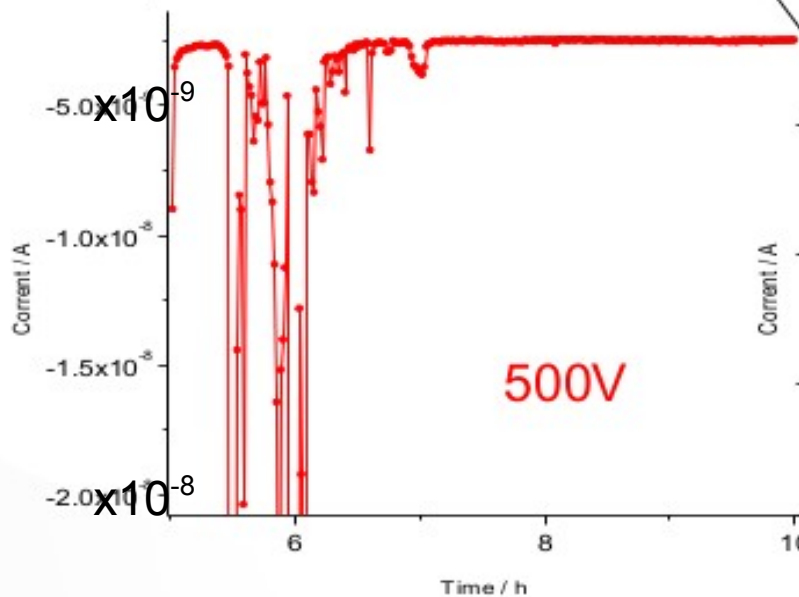
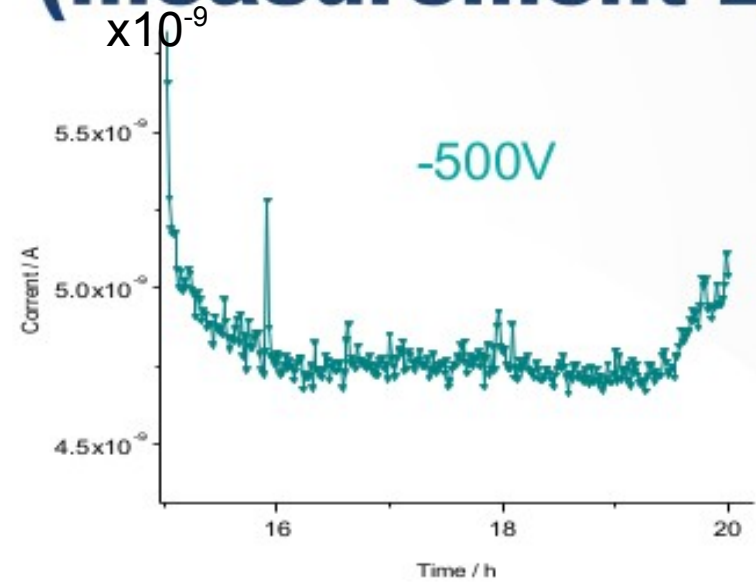
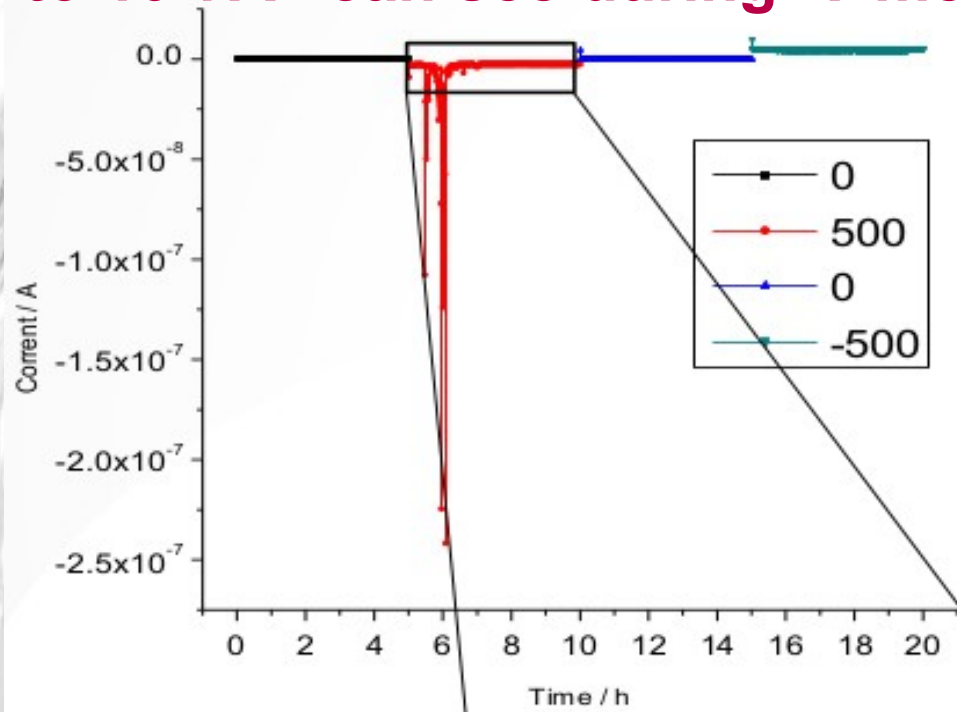


*-Z Top (measurement 1)

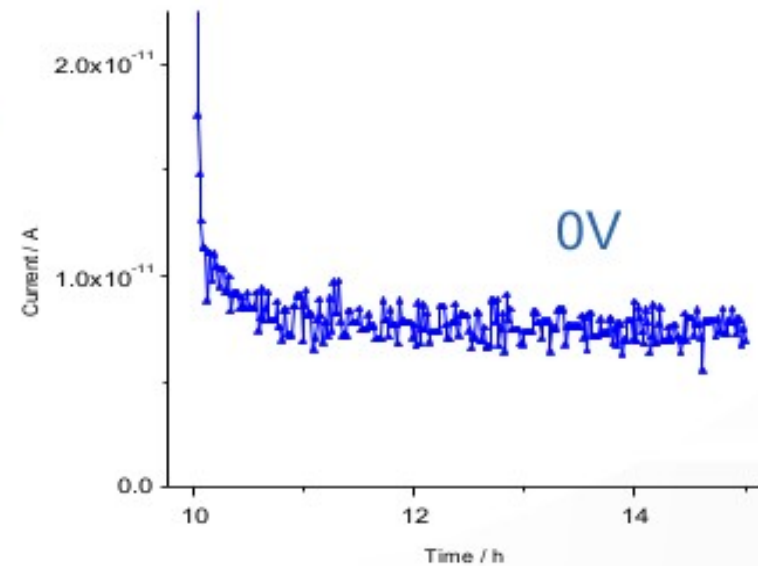
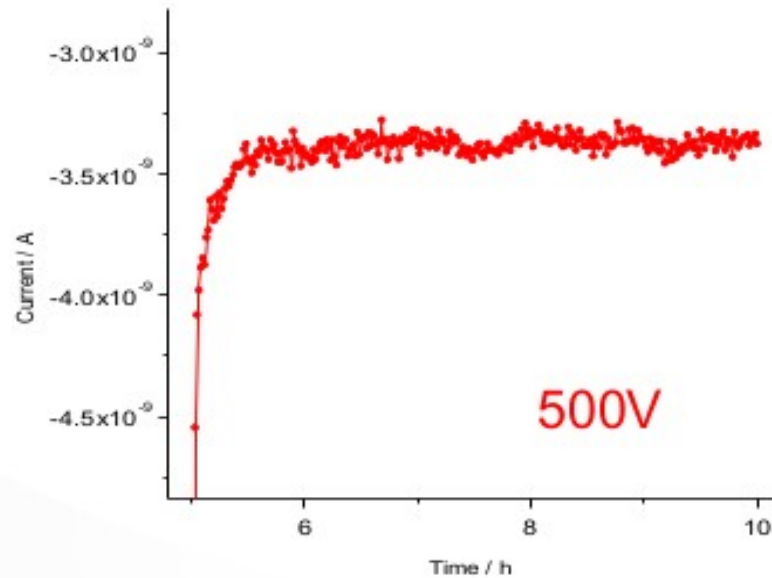
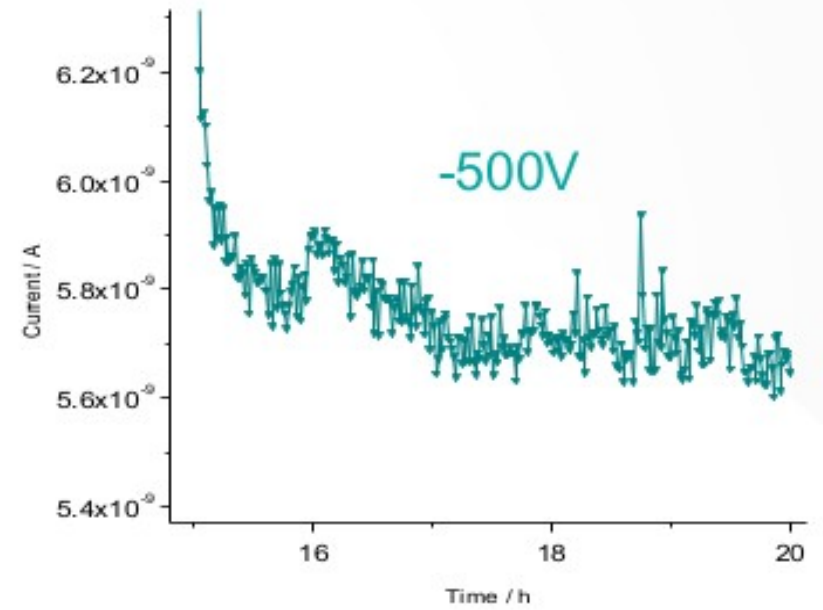
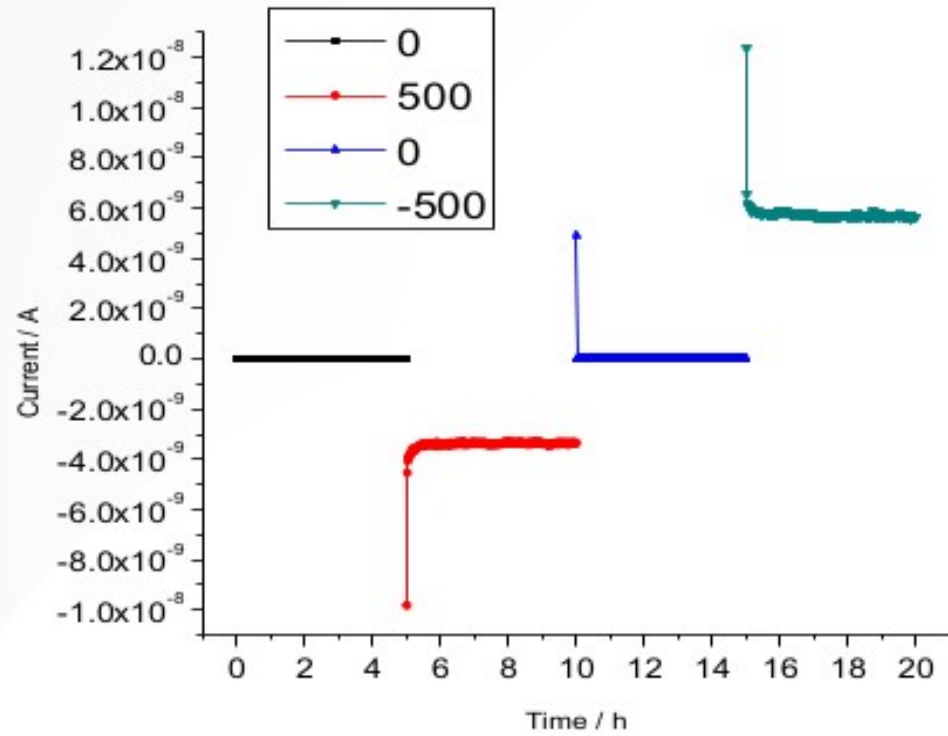


The same behavior - peaks in current to 10⁻⁷A I can see during IV measurements.

* **-Z Top**
(measurement 2)

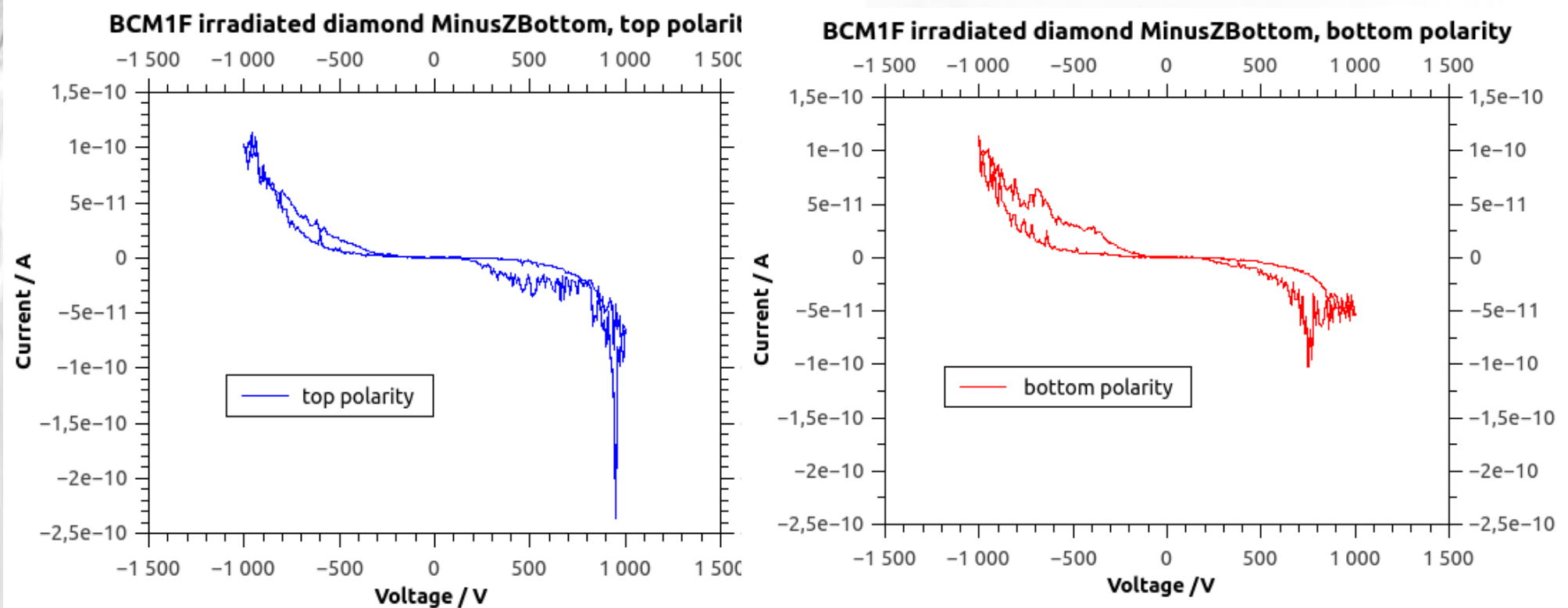


* -Z Bottom



IV characterisation -Z Bottom diamond

current for measurements with source for -500V is $5.8 \times 10^{-9} \text{A}$,
for 500V it is $-3.5 \times 10^{-9} \text{A}$.



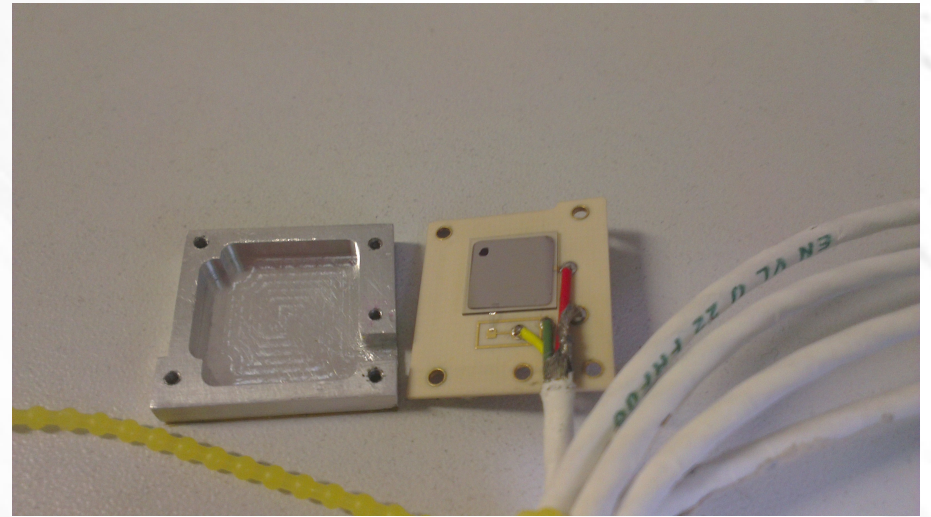
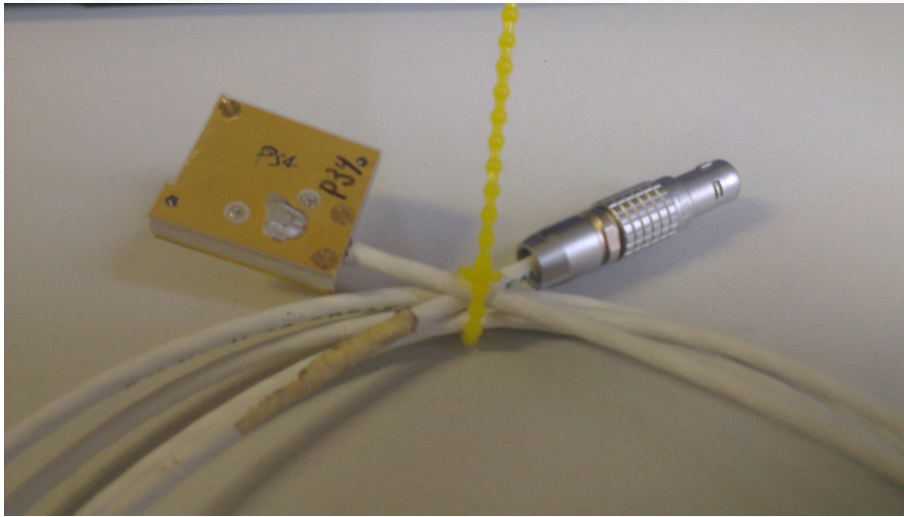
For comparison, leakage current for fresh diamond is value of mkA, w/o source.

Plan of IV measurements

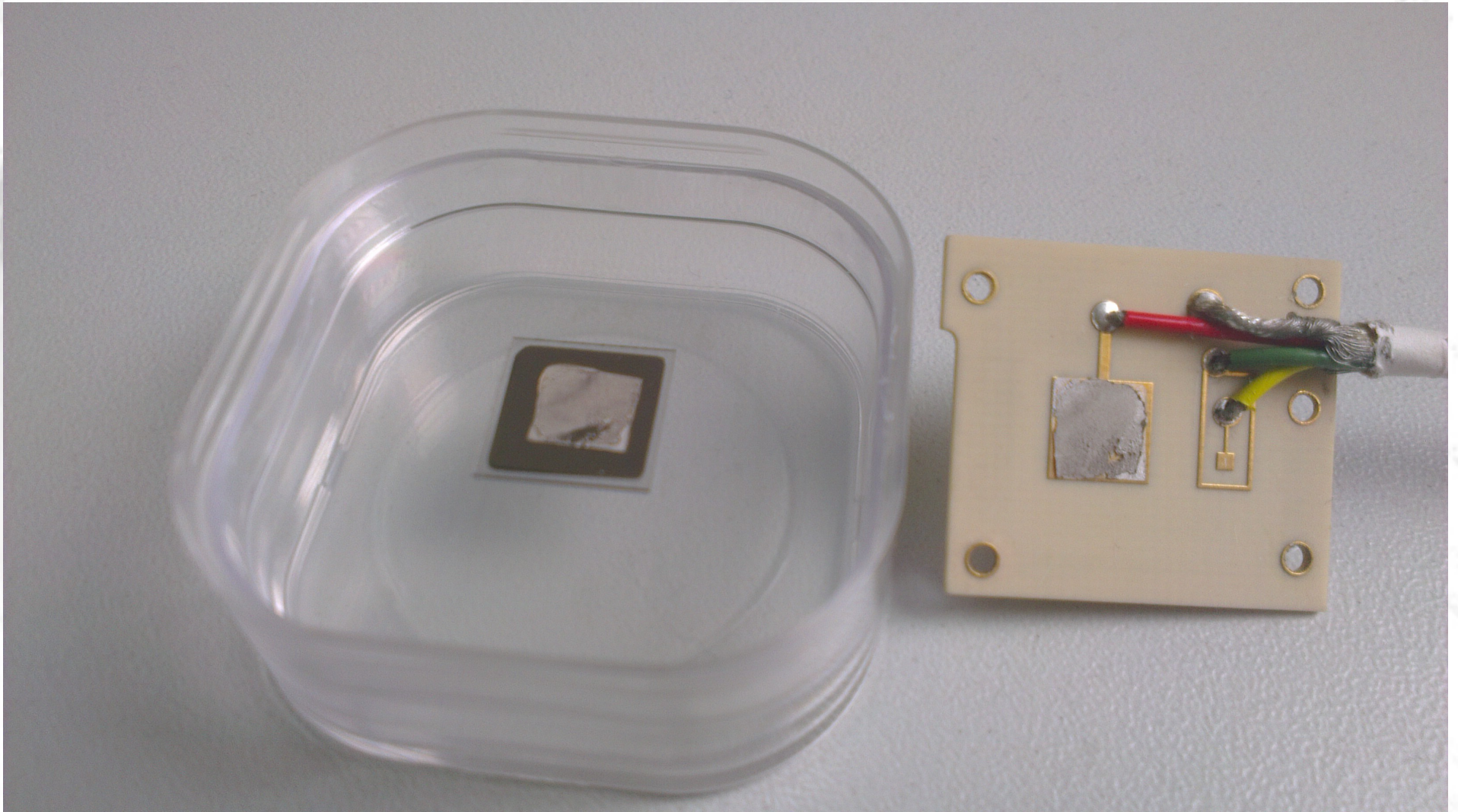
- **+ Z Bottom** - repeat measurement for one of polarities to check behavior
- **+ Z Far** - repeated measurement for one of polarities to check value of leakage current, no it is 1×10^{-10} for 1000V
- **+ Z Near** - done
- **- Z Top** - what is a nature of peaks in leakage current?
- **- Z Bottom** - repeat measurement for one of polarities to check behavior
- **- Z Far** - to do

BCM1L diamonds

- 8 BCM1L diamonds were unmounted. They need to be cleaned from glue and to be put in the frames.
- We need IV, Current over Time characterisation and CCE for all these diamonds.



BCM1L diamonds



16 Sep 2013

Olena Karacheban, DESY-Zeuthen

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