Fabrication and measurements of NIS junctions to characterize plasma etching

Nicolas Paillet

Aalto University

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Two types of InAs Nanowires coming from Copenhaguen :

- Without barrier, and covered with Al
- With InGaAs barrier, without Al

For the covered ones :

$\longrightarrow$ Al heavily oxidized by the travel

$\longrightarrow$ Get rid of this oxide by Plasma Etching

$\longrightarrow$ Fabrication of NIS structures to characterize the Plasma

First we made some tests that are not very relevant :

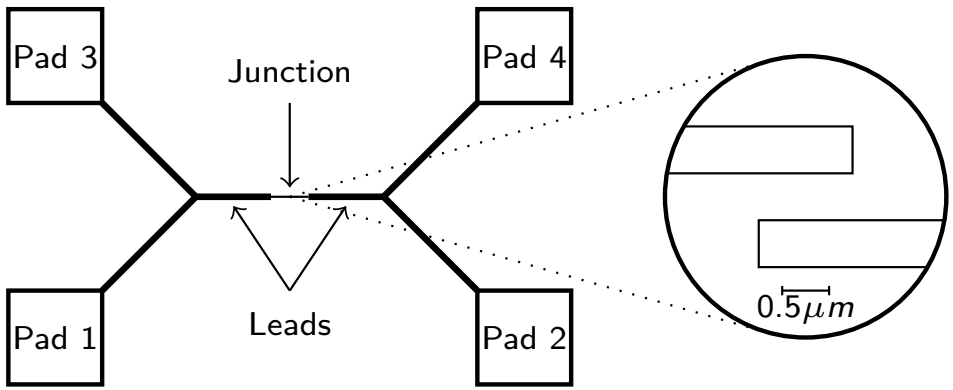
- Two pad patterns $\Longrightarrow$ not handy for 4 probe measurements
- Measurements made with bounds with Matlab

$\longrightarrow$ Not efficient nor relevant

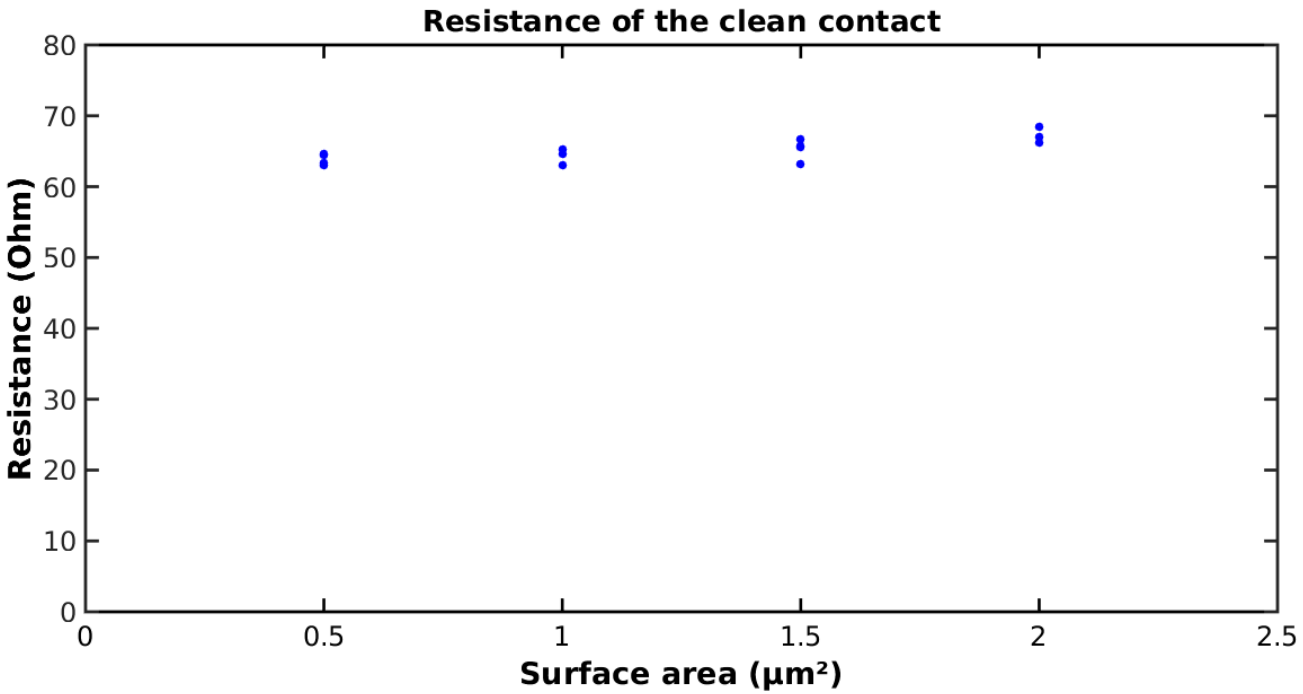
$\Longrightarrow$ Need of a more systematic protocol

$\longrightarrow$ Design of a new pattern

$\longrightarrow$ Measurements with a probestation

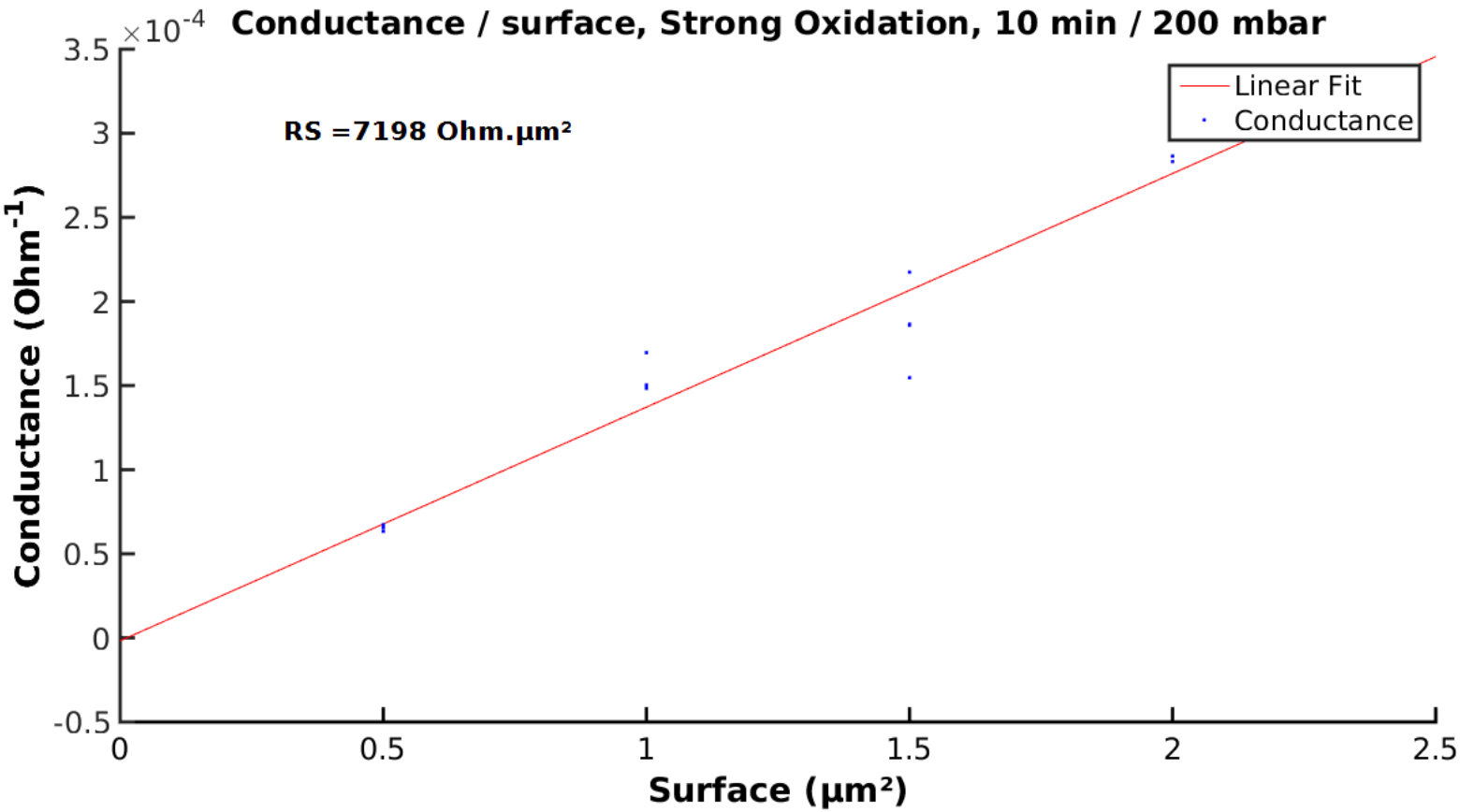


- Clean Contact Al + Cu

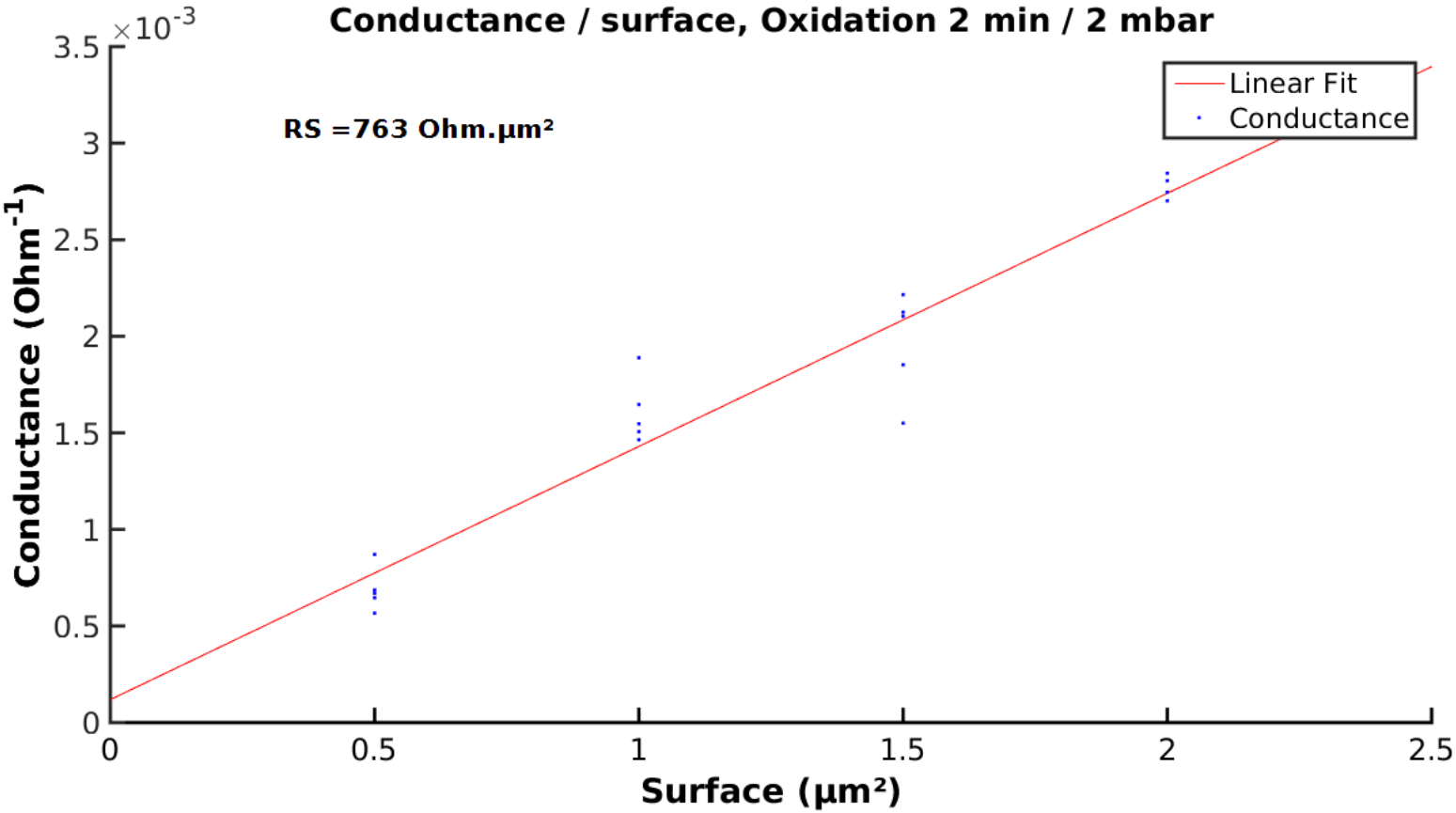


$$R = \sum_{Cu,Al} \frac{\rho l}{S} \simeq 78\Omega$$

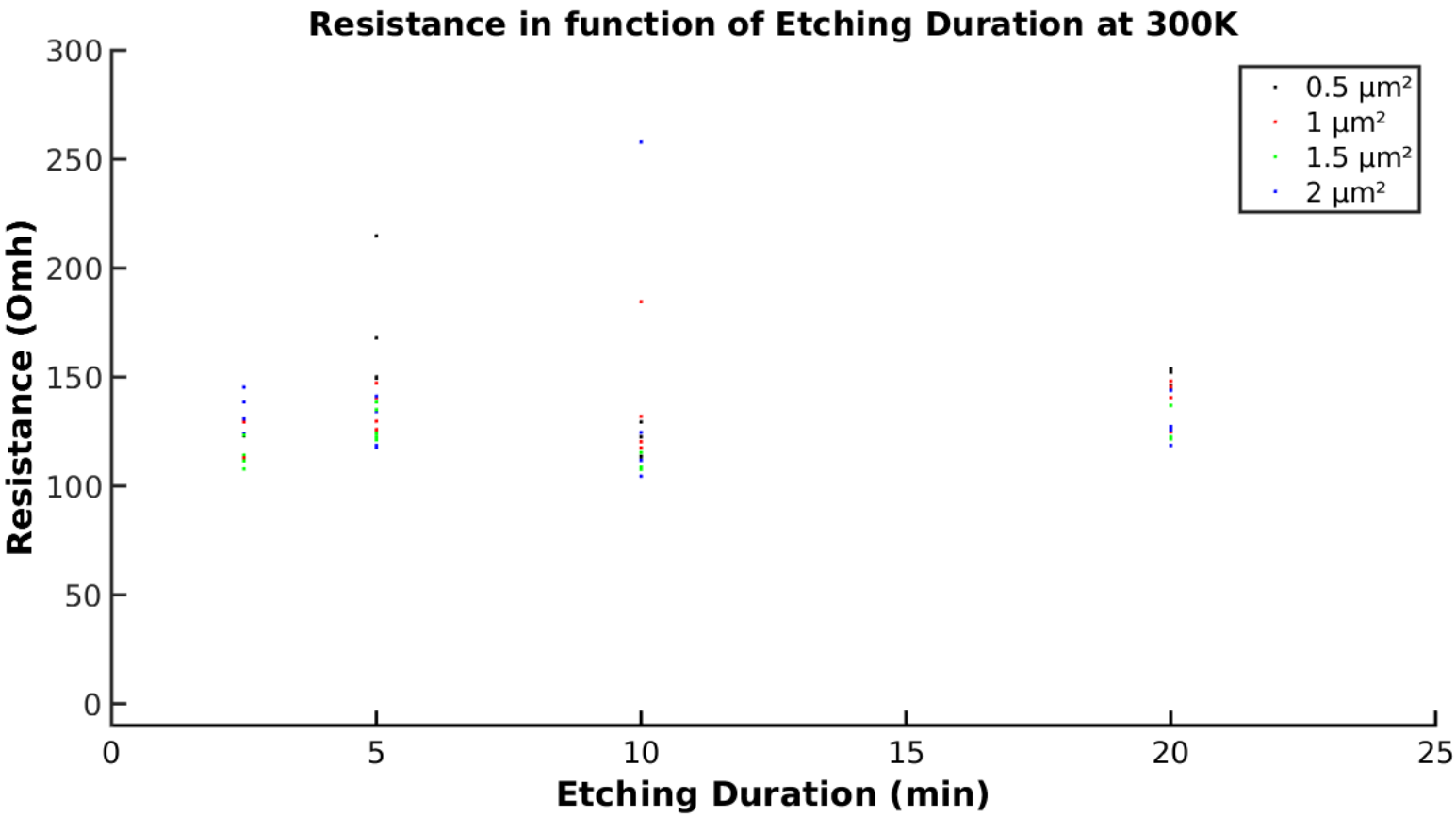
- Strong Oxidation reference 10min / 200mbar



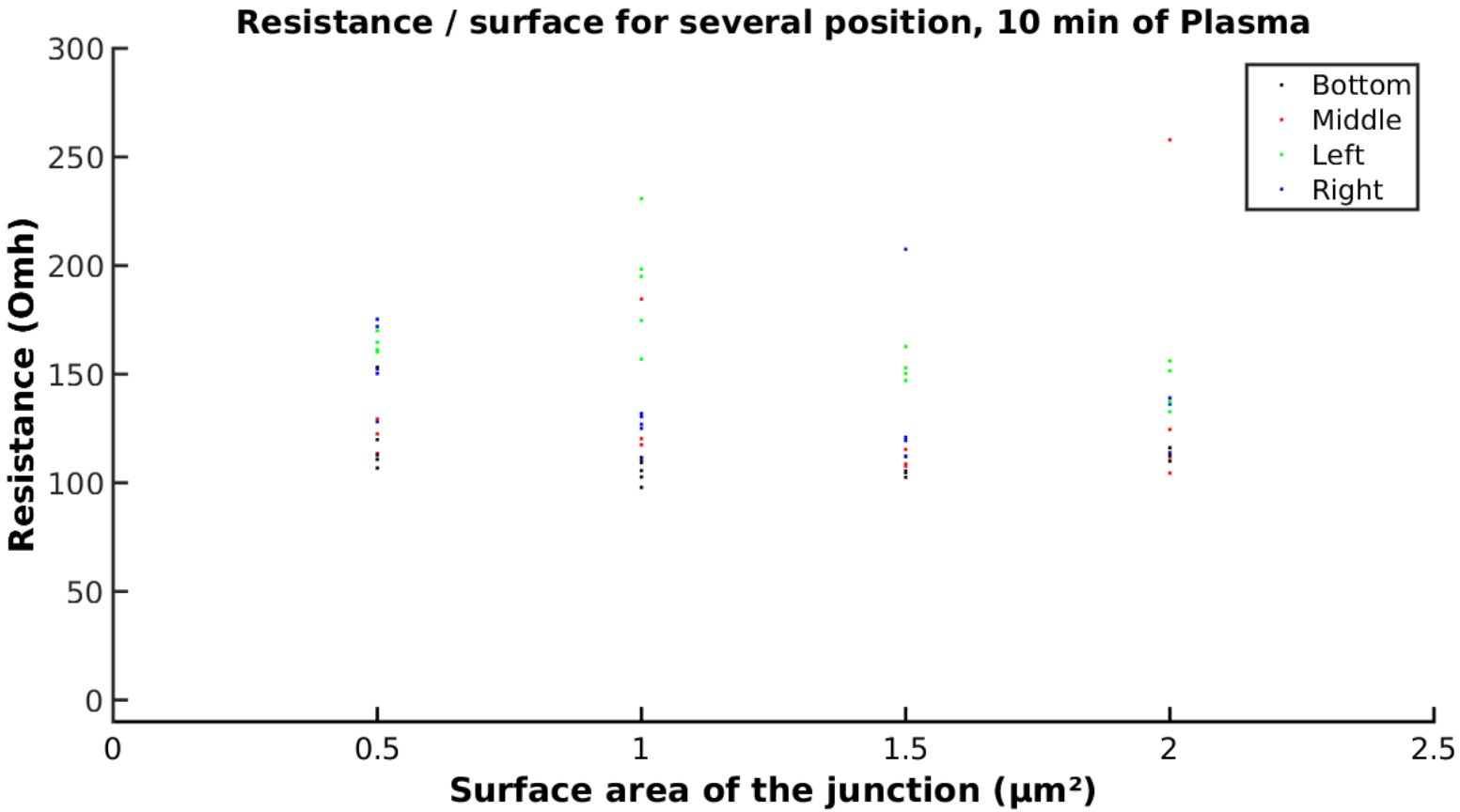
- Regular Oxidation Reference 2min / 2mbar



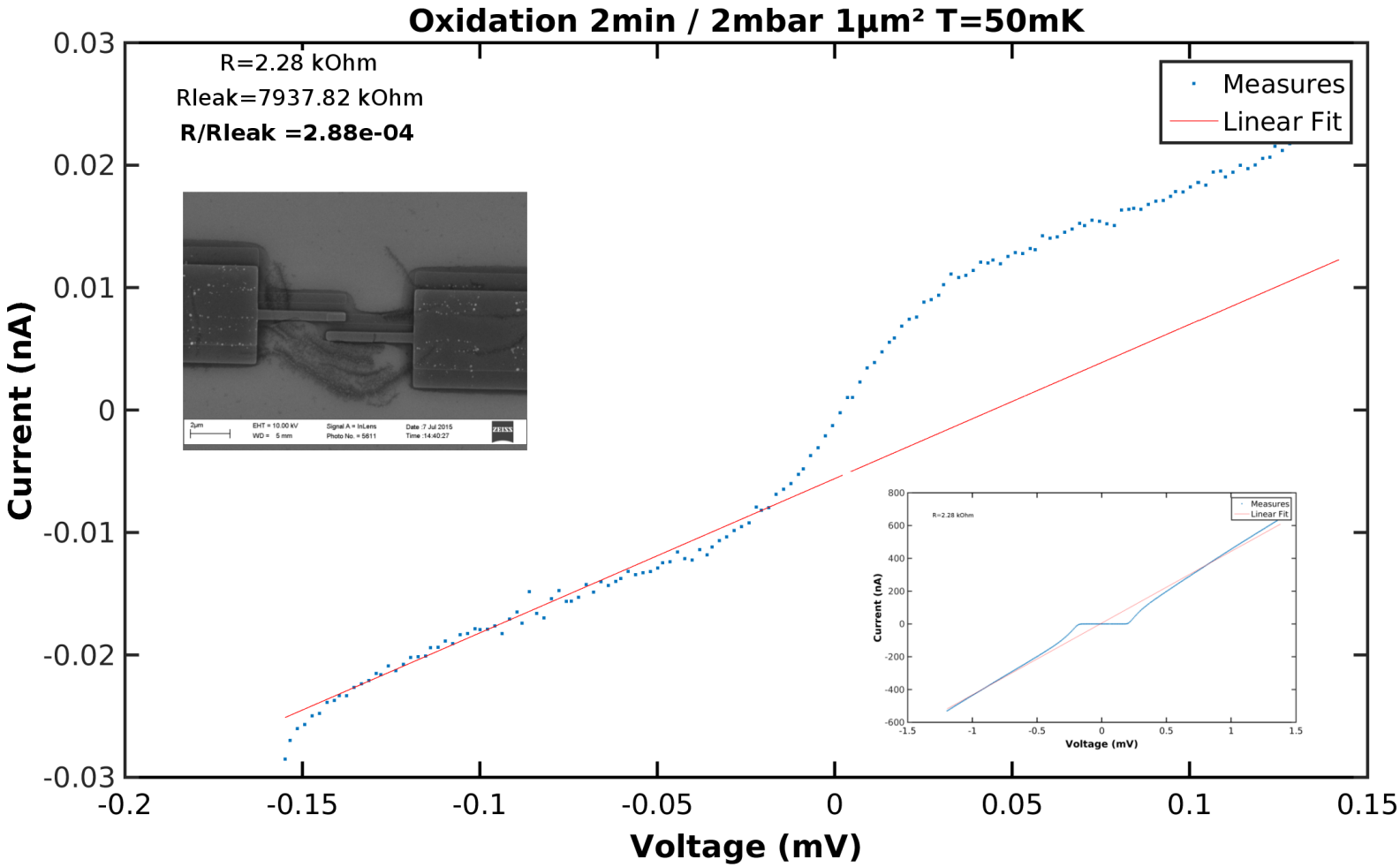
- Time of Plasma



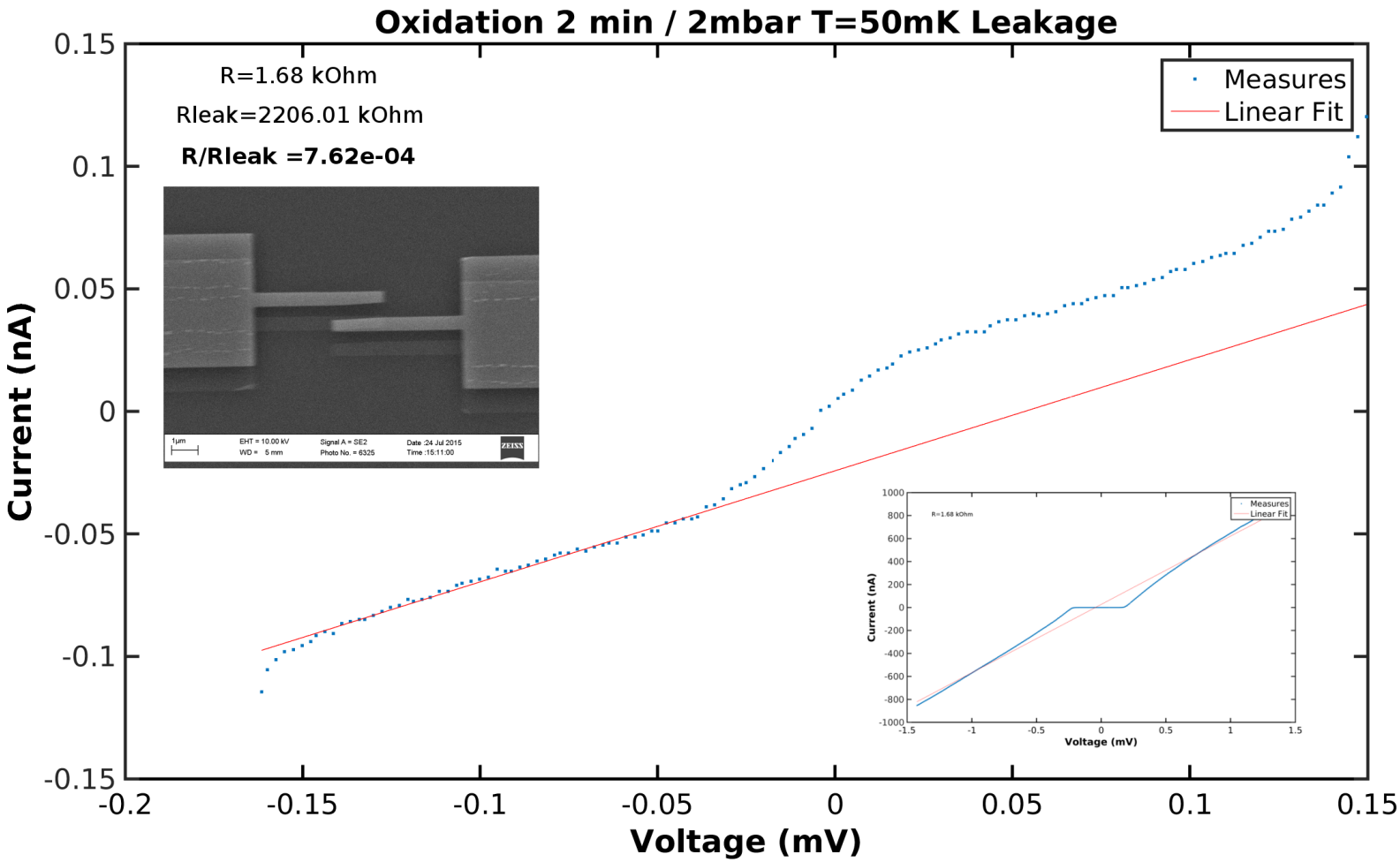
- Position of the sample



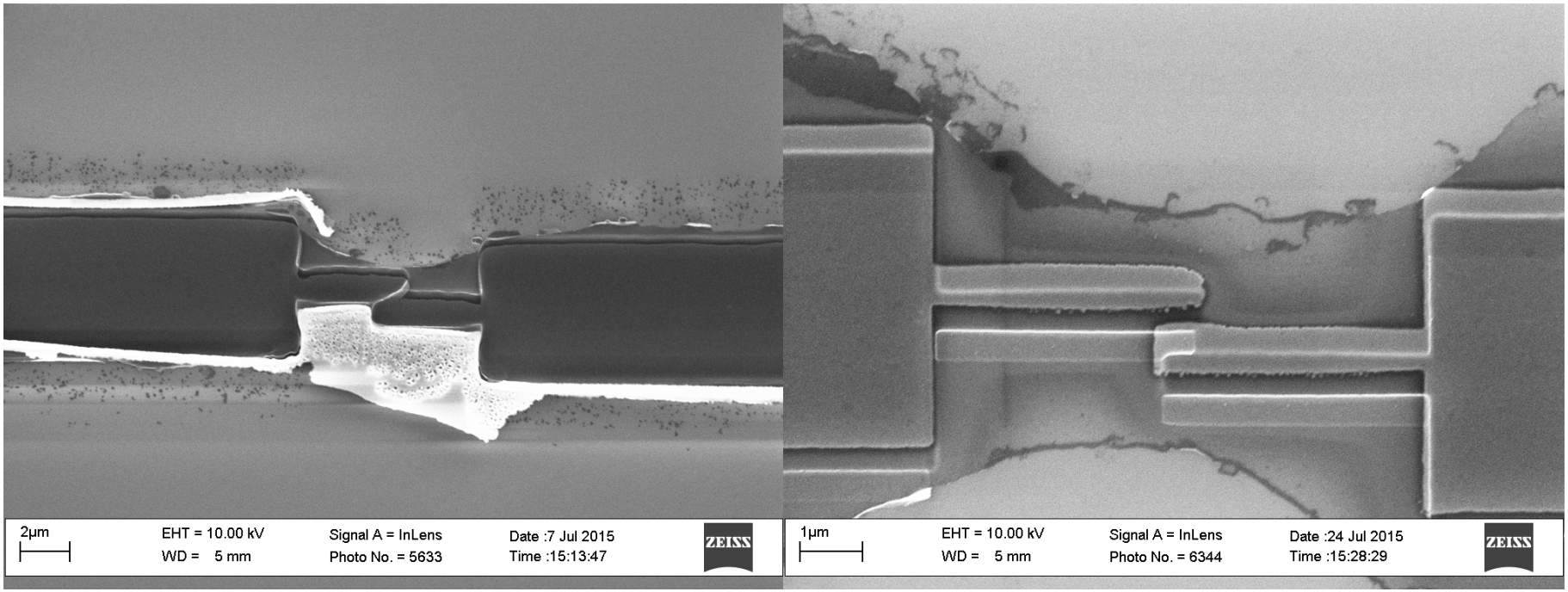
- Regular Oxidation 2min / 2mbar NIS



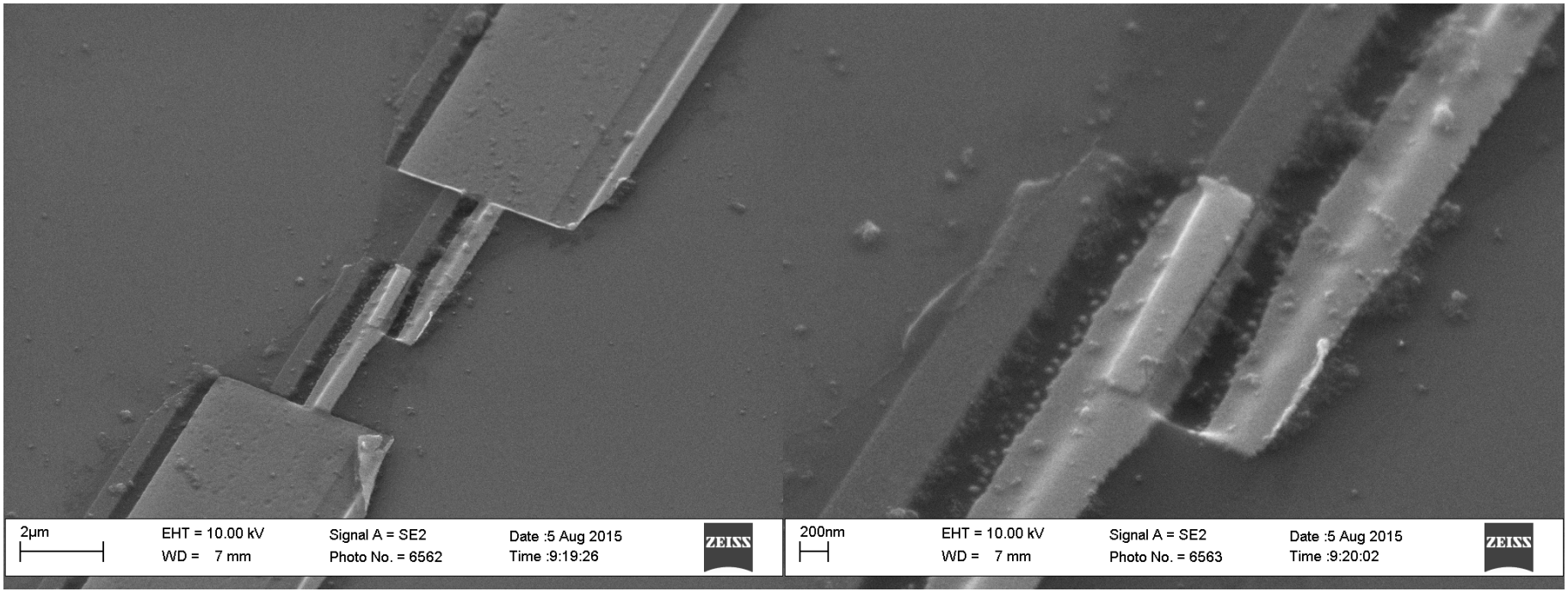
- Regular Oxidation just after the maintenance



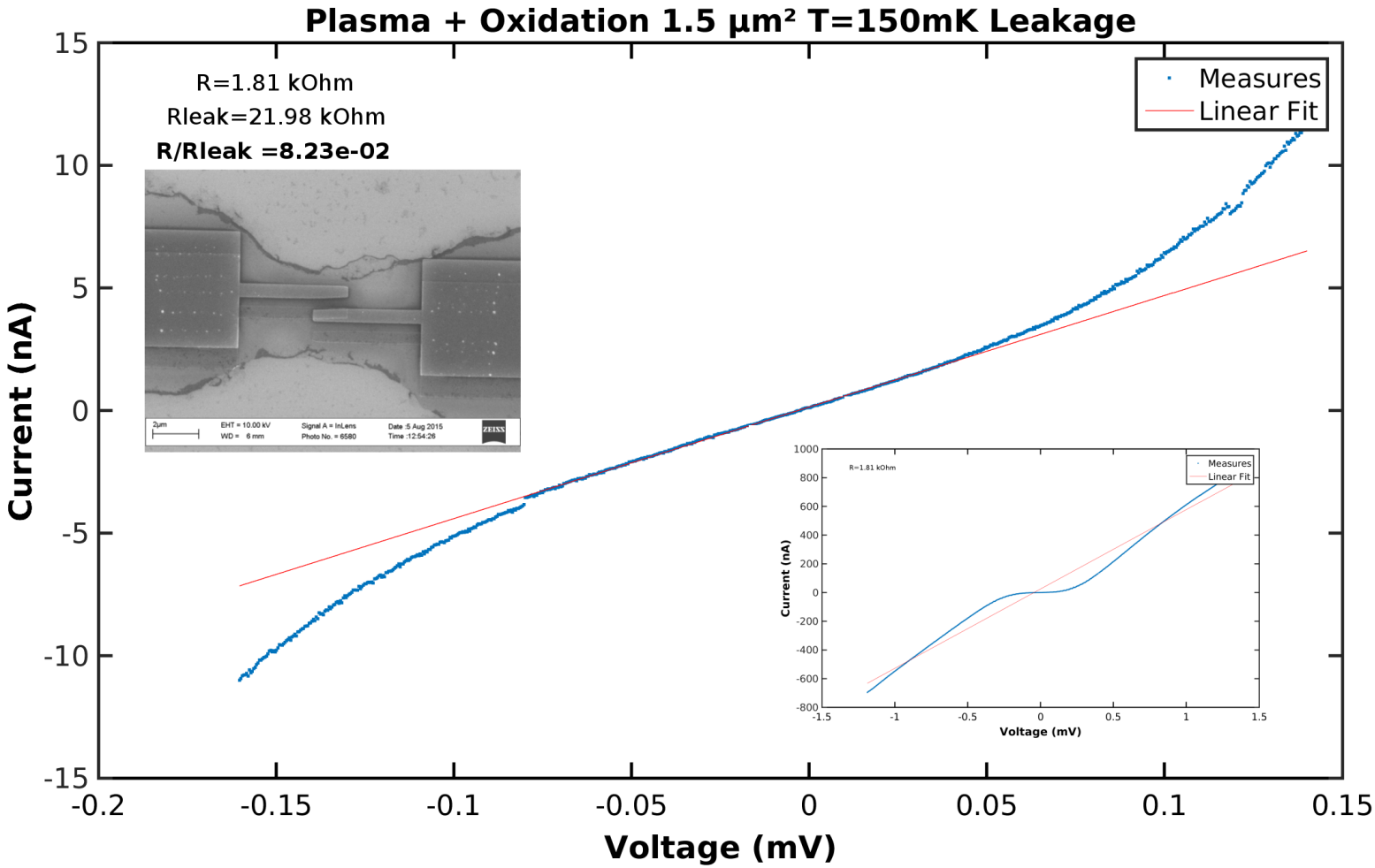
- Burned Samples with 10 min of plasma



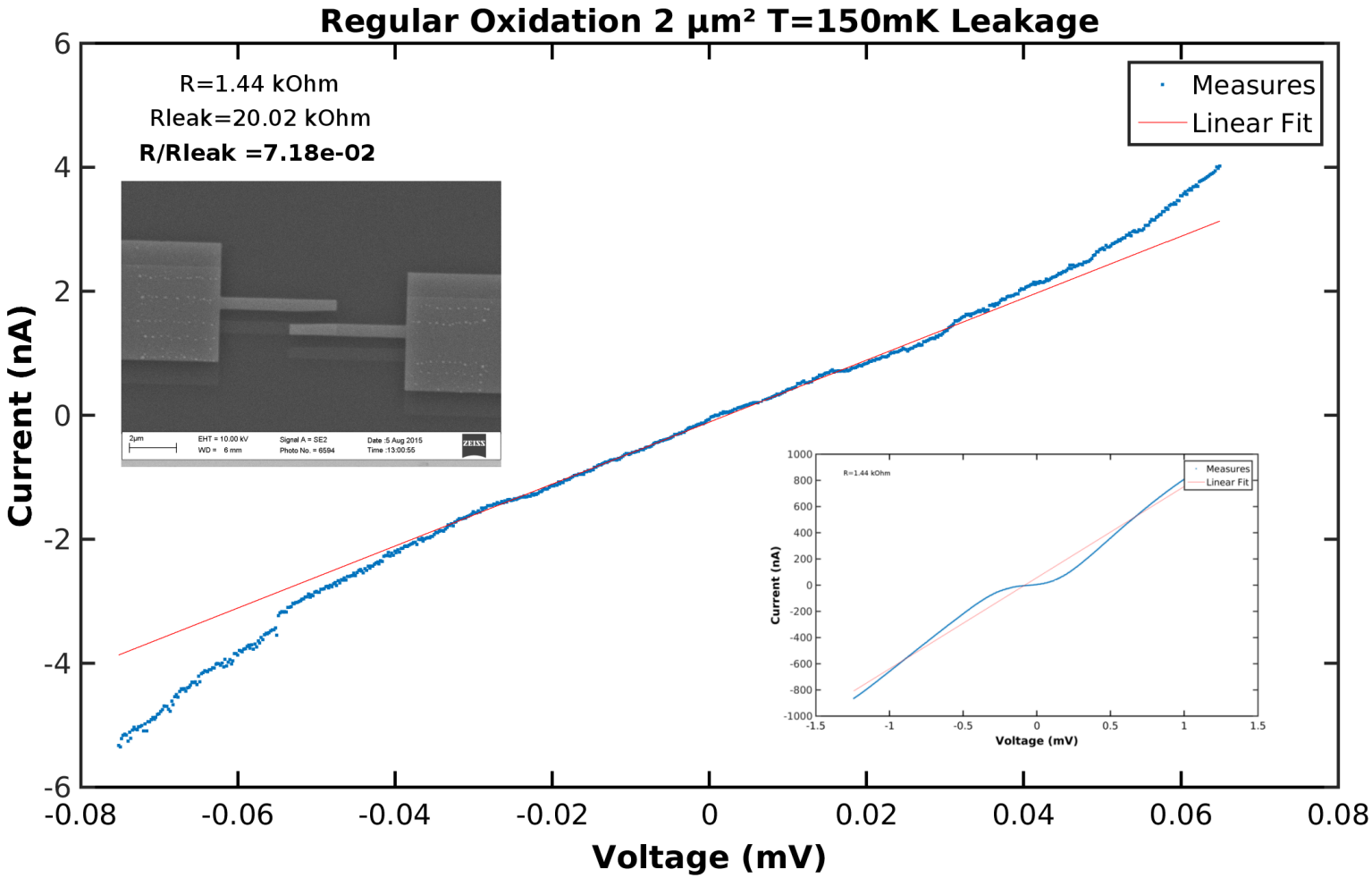
- Wafer etching : 10 min of plasma is too much



- Plasma Oxidation



- Regular Oxidation reference for previous sample



Thank you for your attention !

If you have any questions please ask.